

SONY®

HD DIGITAL VIDEOCASSETTE RECORDER

HDW-250

HDCAM

ISR Interactive
Status
Reporting

MAINTENANCE MANUAL Part 1

1st Edition

Serial No. 10001 and Higher

警告

このマニュアルは、サービス専用です。

お客様が、このマニュアルに記載された設置や保守、点検、修理などを行うと感電や火災、人身事故につながる可能性があります。

危険をさけるため、サービストレーニングを受けた技術者のみご使用ください。

WARNING

This manual is intended for qualified service personnel only.

To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.

Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegebenen Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

AVERTISSEMENT

Ce manuel est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

Vorsicht!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ.
Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.
Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

For the customers in the U.S.A. and Canada

RECYCLING NICKEL-CADMIUM BATTERIES

Nickel Cadmium batteries are recyclable. You can help preserve our environment by returning your unwanted batteries to your nearest point for collection, recycling or proper disposal.
Note: In some areas the disposal of nickel cadmium batteries in household or business trash may be prohibited.



RBRC (Rechargeable Battery Recycling Corporation) advises you about spent battery collection by the following phone number.

Call toll free number: 1-800-822-8837
(United States and Canada only)

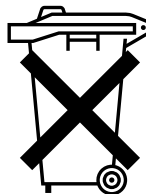
Caution: Do not handle damaged or leaking nickel-cadmium batteries.

Voor de klanten in Nederland

Dit apparaat bevat een (CF)_n-Li batterij voor memory back-up.

Raadpleeg uw leverancier over de verwijdering van de batterij op het moment dat u het apparaat bij einde levensduur afdankt.

Gooi de batterij niet weg, maar lever hem in als KCA.



Bij dit produkt zijn batterijen geleverd.
Wanneer deze leeg zijn, moet u ze niet weggooien maar inleveren als KCA.

Für Kunden in Deutschland

Entsorgungshinweis: Bitte werfen Sie nur entladene Batterien in die Sammelboxen beim Handel oder den Kommunen. Entladen sind Batterien in der Regel dann, wenn das Gerät abschaltet und signalisiert "Batterie leer" oder nach längerer Gebrauchsdauer der Batterien "nicht mehr einwandfrei funktioniert". Um sicherzugehen, kleben Sie die Batteriepole z.B. mit einem Klebestreifen ab oder geben Sie die Batterien einzeln in einen Plastikbeutel.

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Manual Structure

Purpose of this manual

This manual is the maintenance manual of the HD Digital Video Cassette Recorder HDW-250.

This manual describes the maintenance information and the information on primary services such as the replacement of main blocks and circuit board of the HDW-250.

Related manuals

In addition to this Maintenance Manual Volume 1, the following manuals are provided.

- **Operation Manual (supplied with HDW-250)**

This manual describes how to operate the HDW-250.

- **Maintenance Manual Volume 2 (available on request)**

This manual describes the information that premise the service based on parts replacement (diagnostics, parts replacement, electrical alignment, and circuit descriptions, etc.)

If this manual is required, please contact your local Sony Sales Office/Service Center.

Contents

The following is a summary of all the sections for understanding the contents of this manual.

Section 1 Service Overview

Explains the locations of main parts, the functions of printed circuit boards, how to remove and install the cabinet, and measures against trouble.

Section 2 Error Messages and Error Logs

Explains the error messages and error logs.

Section 3 Maintenance Mode

Explains the maintenance mode of the HDW-250.

Section 4 Block Diagram and Circuit Description

Describes the overall block diagrams and circuit descriptions.

Section 5 Periodic Maintenance and Inspection

Explains the cleaning procedures and periodic checks.

Section 6 Spare Parts

Describes exploded views for the HDW-250 and lists of the mounted/printed circuit boards.

Section 1

Service Overview

1-1. Operating Environment

Operating temperature : 0 to 40 °C

Operating humidity : 25 to 85 % (relative humidity)

Storage temperature : -20 to +60 °C

Usage in special environments (measures for cold areas)

Operation of the unit is guaranteed for temperatures of 0 °C to 40 °C. When the unit is used below 0 °C, cover it with a cloth to protect against the cold.

WARNING

If the unit is operated continuously in its carrying case under the following conditions, it may become hot. In such cases, do not remove the unit from the carrying case, as this may result in burns or injury. When the unit is forced to be operated under the following conditions, use the unit after it is removed from the carrying case. If necessary, attach the shoulder strap.

- In direct sunlight
- In a car on a hot day
- Near heating appliances

Power voltage : DC12 ± 5.0 -1.0 V

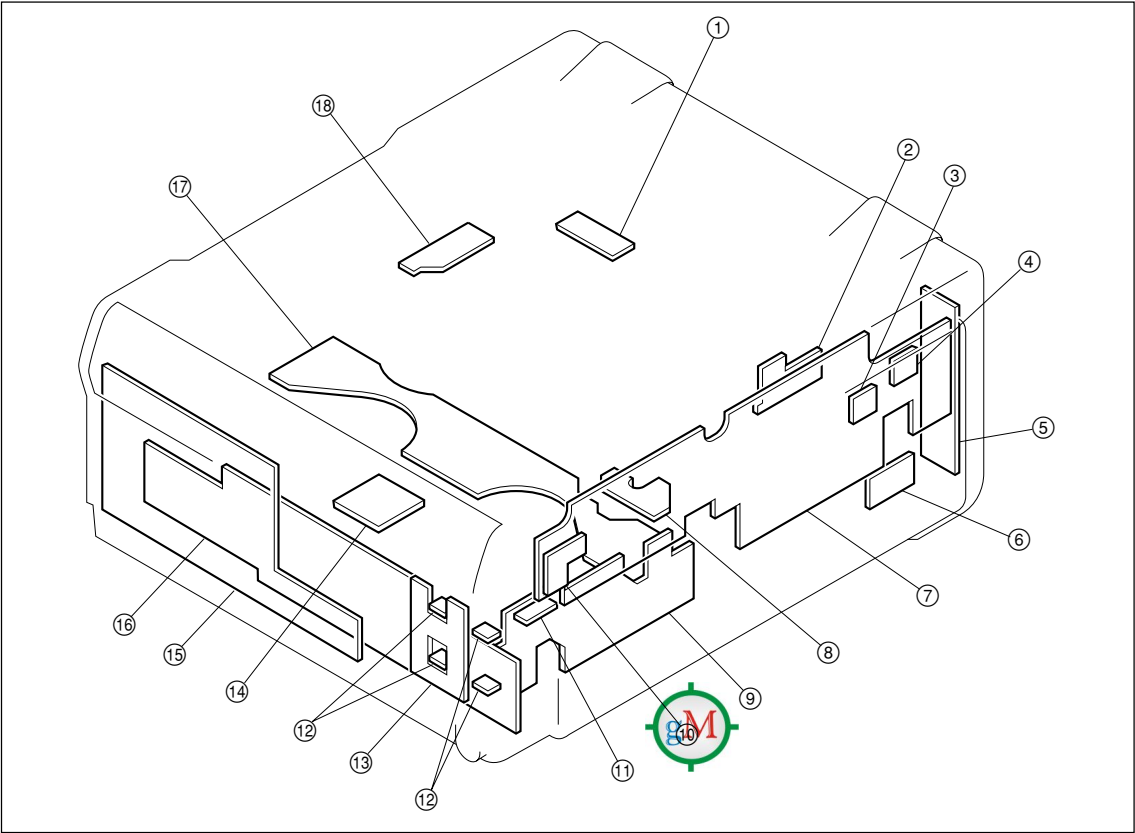
Power consumption : During recording:

About 52 W (CONFI ON, SDI OUT ON, COMPOSITE OUT ON)

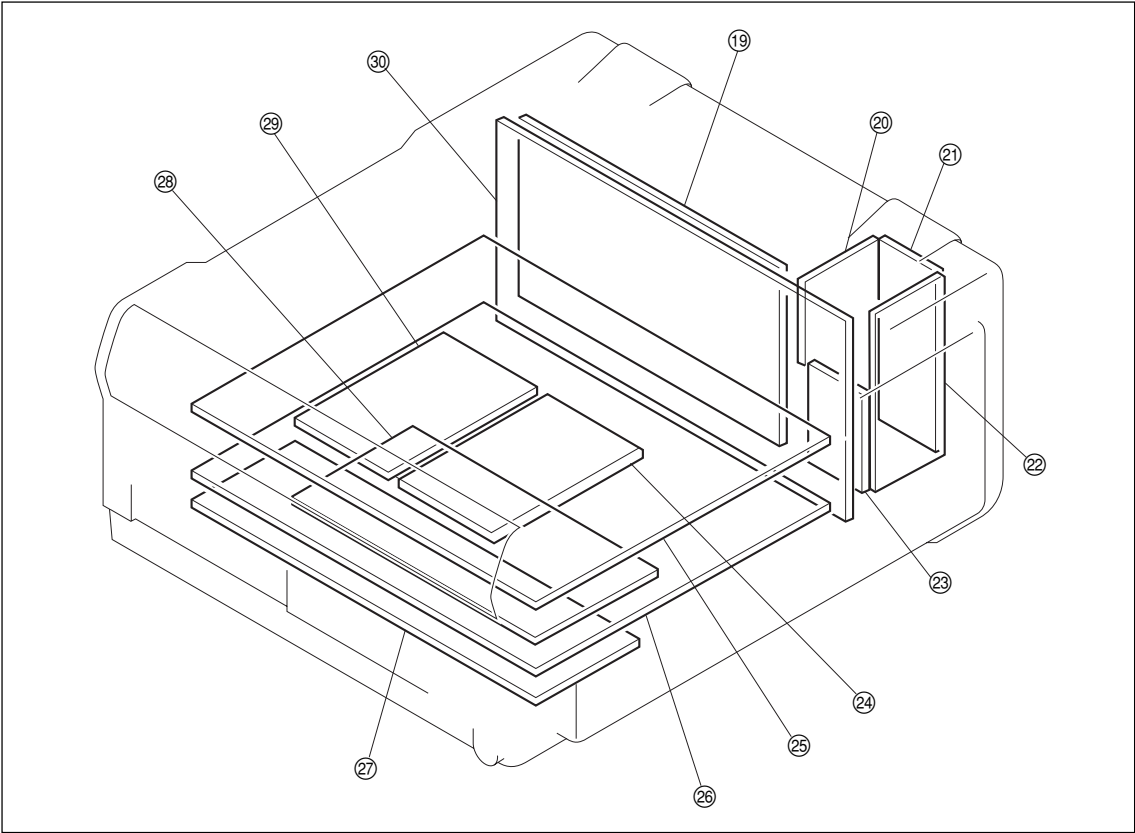
About 38 W (CONFI OFF, SDI OUT OFF, COMPOSITE OUT OFF)

1-2. Locations of Main Parts and Circuit Configuration

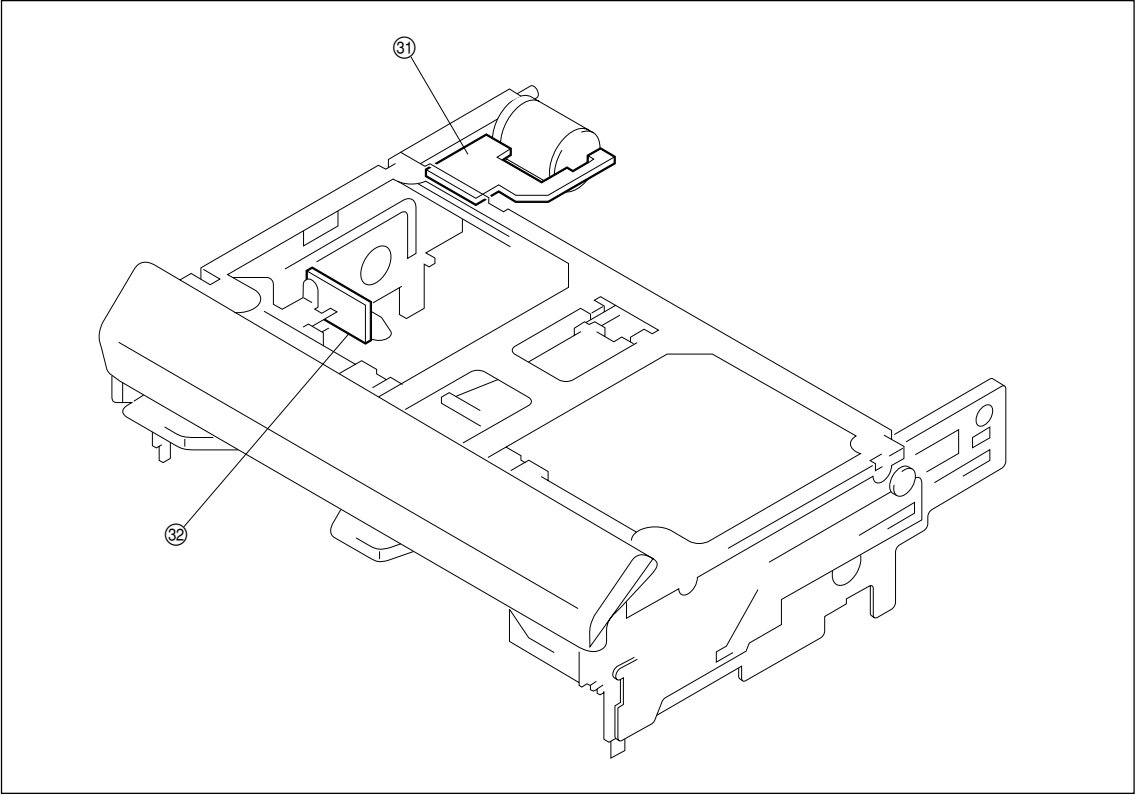
1-2-1. Circuit Configuration and Printed Circuit Board Layout Diagram



System	Board name	Function	No.
VIDEO	CC-82	Video Input/Output	⑨
AUDIO	CP-337	Audio Input/Output, Panel Switches	⑦
	ADA-44	Audio Signal Processor (AD/DA)	⑯
	VR-194	Audio Rec Level Selector (Preset/Variable)	⑬
	VR-206	Audio Rec Level Control	⑫
	VR-254	Phone Level Control	⑪
	DUS-173	Head Phone Connector	⑩
	KY-315	Panel Switches	⑮
SERVO, SYSTEM CONTROL, TIMECODE	CN-1752	TC IN/OUT Connectors	⑥
	SE-510	Sensor (Casette Coding)	⑰
	DET-36	Sensor (Thread/Unthread)	⑧
	DET-15	Cassette In Detector	②
	TR-57	S-Tension Detector	⑱
POWER SUPPLY	DC-85	DC Input Select Switch	③
	FU-76	Battery/EXT DC Selector	⑤
OTHERS	CN-1795	Camera Remote Connector	④
	CN-1926	Connection	①
	SE-435	(Reserved for future standardization)	⑭



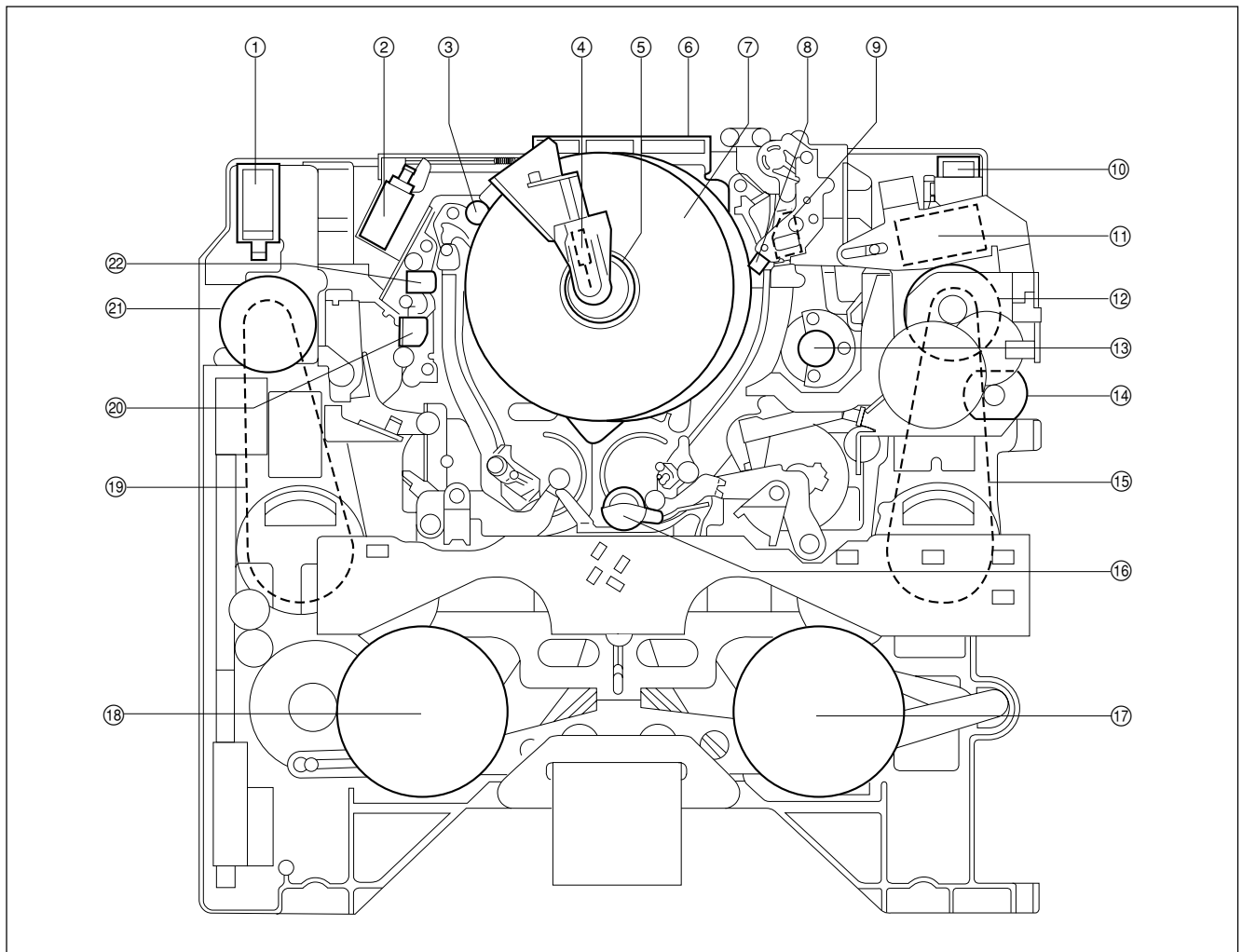
System	Board name	Function	No.
VIDEO	VPR-53	Ref CK Generator, Video Signal Processor (AD/DA)	26
DIGITAL PROCESS	DCP-22	Down Converter	28
	DPR-125	Digital Data Processor (Encode/Decode, Error Correction)	27
		Data Rate Converter	
RF & CUE	EQ-76	Rec Current Control	
		RF Equalizer(PB EQ, PB Envelope Detector),	19
		Rec Envelope Detector	
SERVO, SYSTEM CONTROL, TIMECODE	SST-13	Cue Rec/PB	
		Servo & System Control, Timecode IN/OUT Buffer & Rec/PB Amp	25
		Full Erase & Channel Erase Oscillator	
POWER SUPPLY		CTL Rec/PB Amp	
	PSW-67	Switching Driver	20
	PSW-68	Switching Driver	22
	PSW-69	PWM Power Control	21
OTHERS	PSW-70	Connection	23
	MB-825	Motherboard	30
	TX-68A	HD SDI Module	29
	RX-46A	HD SDI Module	24



System	Board name	Function	No.
SERVO,	CS-25	Cassette Up/Down Detector	31
SYSTEM CONTROL, TIMECODE	CS-26	Cassette Up/Down Detector	32

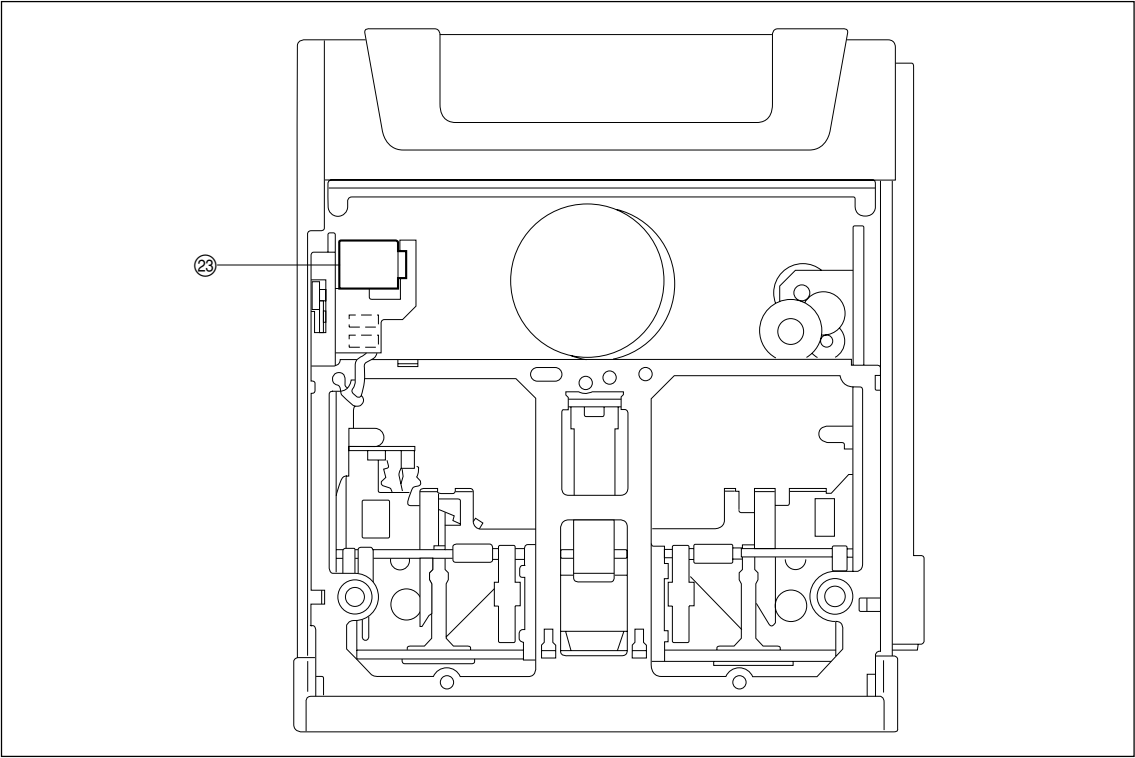
1-2-2. Locations of Main Mechanical Parts

Mechanism deck



- | | |
|---|--------------------|
| ① Plunger solenoid (S reel brake) | ⑫ T reel motor |
| ② Plunger solenoid (Head cleaner) | ⑬ Capstan motor |
| ③ Video head cleaning roller (AHC roller) | ⑭ Threading motor |
| ④ Brush | ⑮ T reel belt |
| ⑤ Slip ring | ⑯ Pinch roller arm |
| ⑥ Drum assembly | ⑰ T reel table |
| ⑦ Upper drum | ⑱ S reel table |
| ⑧ CUE brush | ⑲ S reel belt |
| ⑨ CUE/TC head | ⑳ FE head |
| ⑩ Plunger solenoid (T reel brake) | ㉑ S reel motor |
| ⑪ Plunger solenoid (Pinch roller) | ㉒ CTL head |

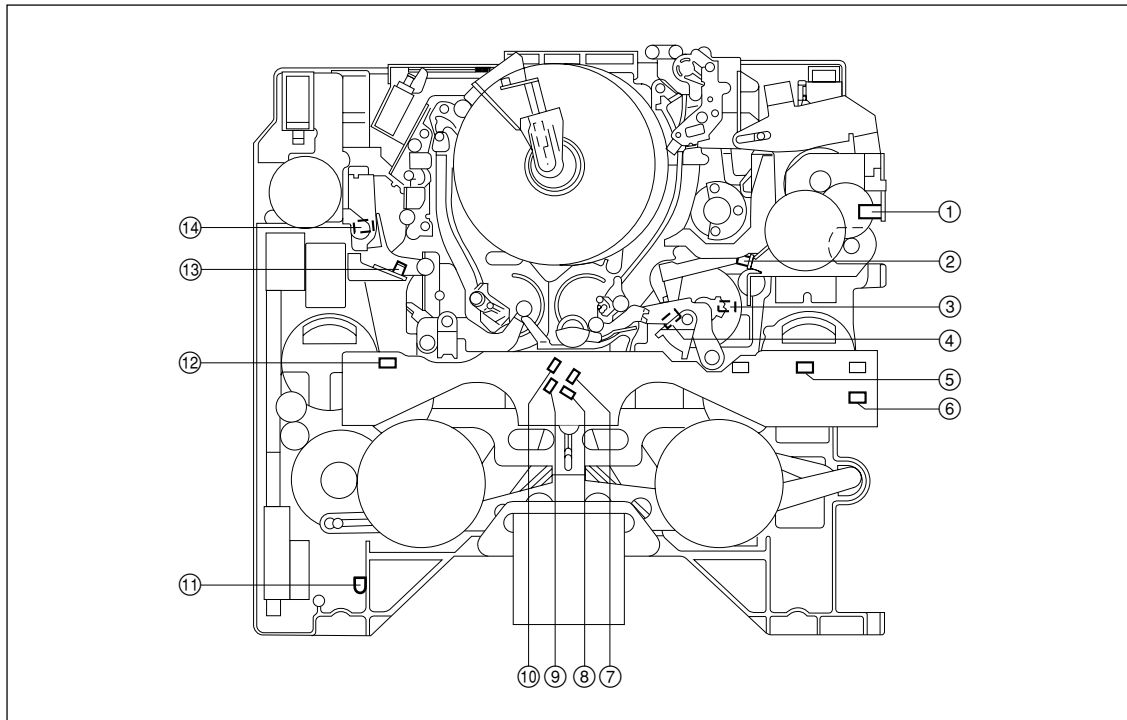
Cassette compartment



②③ DC motor

1-2-3. Functions and Locations of Sensors

Mechanism deck



① Threading FG sensor

This sensor detects the rotation speed of the threading motor.

The FG output signal of this detection sensor is input to the servo circuit to control the threading speed so that the tape is not damaged during threading.

② Tape top sensor

This sensor detects the tape end when running in the reverse direction.

③ Threading-end sensor

④ Unthreading-end sensor

These sensors detect when the S/T drawer guides and S/T sliders reach the threading-end or unthreading-end position by the rotation angle of the gear.

⑤ L cassette sensor

This sensor detects whether the size of the inserted cassette is an L size cassette.

⑥ L cassette REC INHIBIT sensor

This is the REC inhibit plug sensor switch for large (L size) digital cassettes.

⑦, ⑧, ⑨ Format ID sensors

These sensors identify the format of the cassette tape inserted into the unit.

⑩ Cleaning tape recognition sensor

This sensor recognizes whether the cassette tape inserted into the unit is a cleaning cassette.

⑪ Condensation sensor

This sensor detects the presence of condensation in the unit.

⑫ S cassette REC INHIBIT sensor

This is a REC inhibit plug sensor switch for small digital cassettes.

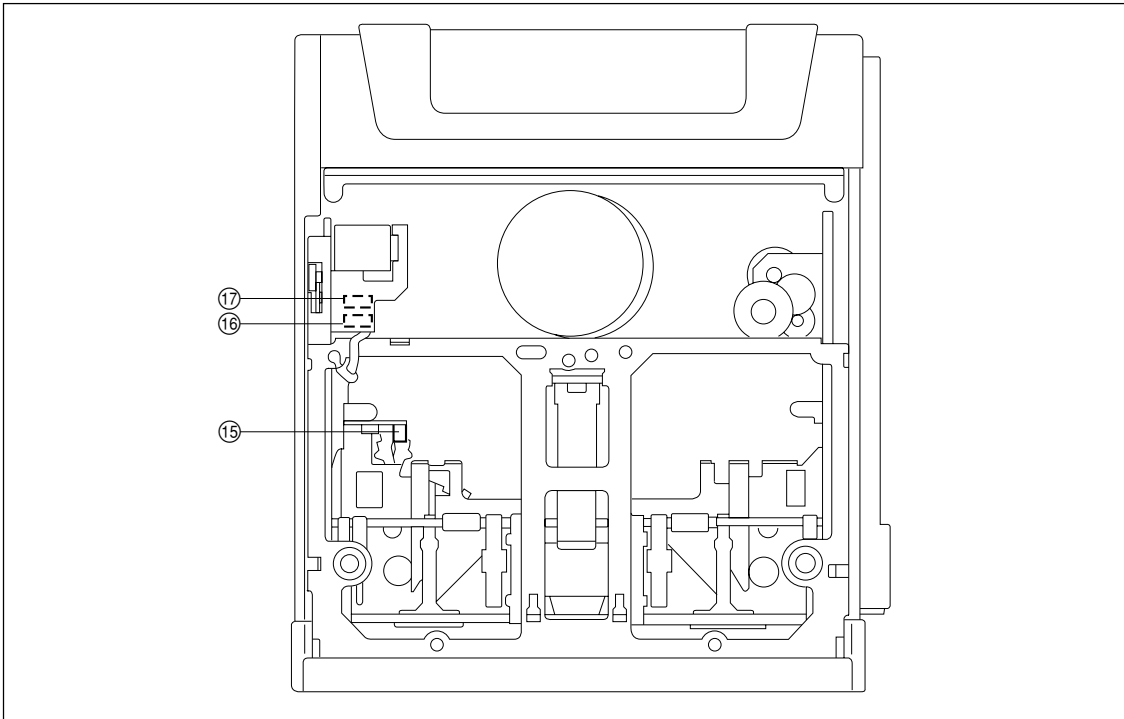
⑬ Tape end sensor

This sensor detects the tape end when running in the forward direction.

⑭ S tension sensor

This sensor detects the position of the tension arm, and controls the reel torque during recording and playback to keep the tension of S tape constant.

Cassette compartment



- ⑮ Cassette-in sensor
This sensor detects whether a cassette is being inserted.

- ⑯ Cassette-up sensor

- ⑰ Cassette-down sensor
These sensors detect the movement of the cassette compartment by the combination of ON/OFF of the cassette-down sensor, cassette-up sensor and cassette-in sensor.

1-3. Matching Connectors

Use the following connectors and cables, or their equivalents when connecting cables to the connectors on the connector panel.

Panel indication	Matching connector/cable	
	Name	Sony part No.
VIDEO IN HD SDI IN, HD SDI OUT REF IN ANALOG HD COMPONENT, COMPOSITE TC IN, TC OUT	BNC	1-569-370-12
AUDIO IN CH-1 to CH-4	XLR 3P, FEMALE	1-508-083-00
AUDIO OUT CH-1 to CH-4	XLR 3P, MALE	1-508-084-00
DC IN 12V	XLR 4P, FEMALE	1-508-362-00
CAMERA	26P, MALE (ROUND TYPE)	
REMOTE	D-SUB 9P, MALE	1-560-651-00
	JUNCTION SHELL	1-561-749-00
CAMERA REMOTE	ROUND TYPE 8P, MALE	1-766-848-11

1-4. Signal Inputs and Outputs

INPUTS

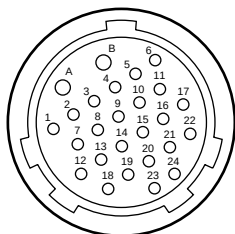
HD SDI IN	HD serial digital component (including audio 4 channels) SMPTE-292M/BTA S-004B
VIDEO (REFERENCE IN)	REFERENCE IN Analog composite reference video signal 1125/60 or 1125/59.94 reference video signal : TRI SYNC 0.6 Vp-p, 75 Ω (sync negative) 525 reference video signal : Black burst 0.286 Vp-p, 75 Ω (sync negative) (Selected from the menu)
CAMERA	Analog component video : 1.0 Vp-p, 75 Ω (sync negative) (Y) 0.7 Vp-p, 75 Ω (sync negative) (PB/PR) Analog audio : Switchable between -60 , -20 and $+4$ dB, high impedance, balanced
AUDIO CH-1 to CH-4	Analog audio : Switchable between -60 , -20 and $+4$ dB, high impedance, balanced
TC IN	0.5 to 18 Vp-p, impedance 10 k Ω ± 10 %
DC IN 12 V	11 to 17 V

OUTPUTS

HD SDI OUT	HD serial digital component (including audio 4 channels) SMPTE-292M/BTA S-004B
ANALOG HD COMPONENT MONITOR OUT	HD analog component video : 0.1 Vp-p, 75 Ω (Y/PB/PR), unbalanced Conforming to BTA S-001, superimposing can be switched ON or OFF
COMPOSITE MONITOR OUT	Analog composite video : 1.0 Vp-p, 75 Ω Superimposing can be switched ON or OFF
CAMERA	GEN LOCK SYNC : TRI SYNC 0.6 Vp-p, 75 Ω (sync negative) RETURN VIDEO : 1.0 Vp-p, 75 Ω (sync negative) (Y)
AUDIO CH-1 to CH-4	Analog audio : $+4$ dBm (0 dBm) low impedance, balanced
EARPHONE	-17 dBu
HEADPHONES	-17 dBu
TC OUT	1.0 Vp-p (75 Ω), 2.2 Vp-p (10 k Ω)

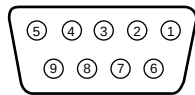
OTHERS

REMOTE	Sony 9-pin protocol or interface for RS-232C (switchable)
CAMERA REMOTE	For camera remote control (Sony new command)

CAMERA : 26-pin (female)**– External view –**

Pin No.	Signal	I/O	Specifications
1	Sync signal	Out	Conforms to BTA S-001
2	Sync signal shield	Out	Input/output impedance : 75 Ω
3	Y video signal shield	In	
4	Y video signal	In	
5	Pr video signal	In	
6	Pr video signal shield	In	
7	Pb video signal	In	
8	Pb video signal shield	In	
9	CH-1 MIC (+)	In	Signal level : –20 dBs
10	CH-1 MIC (–)	In	Output impedance : Low impedance
11	CH-1/CH-2 MIC shield	In	Input impedance : High impedance
12			Not used
13			Not used
14			Not used
15	CH-1 MIC (+)	In	Signal level : –20 dBs
16	CH-1 MIC (–)	In	Output impedance : Low impedance
17	Spare		Not specified
18	Loopback video signal	Out	Conforms to BTA S-001A
19	Loopback video signal shield	Out	Input impedance : 75 Ω
20	Audio monitor signal	Out	Signal level : –6 dBs Output impedance : Low impedance
21	Digital command A	Out	Specified by BTA S-1005B
22	Digital command B	Out	
23	Digital command A	In	
24	Digital command B	In	
A	Power supply	Out	DC +10.6 V to +17 V, maximum 5 A
B	GND (power supply)	Out	
Shell	Entire shield		

REMOTE : 9-pin (female)



– External view –

Switchable between Sony 9-pin protocol and ISR using the setup menu.
(For the switching procedure, refer to Section “3-1. Setup menu”.)

SONY 9-pin protocol

Pin No.	Signal
1	Frame Ground
2	Receive A
3	Transmit B
4	Transmit Common
5	Spare
6	Receive Common
7	Receive B
8	Transmit A
9	Frame Ground

ISR

Pin No.	Signal
1	CD ; Carrier Detect
2	RXD ; Recieved Data
3	TXD ; Transmitted Data
4	DTR ; Data Terminal Ready
5	GND ; Signal Ground
6	DSR ; Data Set Ready
7	RTS ; Request to Send
8	CTS ; Clear to Send
9	CI ; Calling Indicator

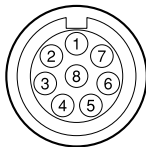
DC IN : XLR, 4-pin (male)



– External view –

Pin No.	Signal
1	GND (EXT DC)
2	–
3	–
4	EXT DC IN

CAMERA REMOTE : 8-pin (Female)



– External viwe –

Pin No.	Signal
1	TX RCP DATA (X)
2	TX RCP DATA (Y)
3	RX RCP DATA (X)
4	RX RCP DATA (Y)
5	TX GND
6	+12 V
7	GND
8	–
	CHASSIS GND



1-5. Removing and Reinstalling the Cabinets

CAUTION

Before performing the following procedure, be sure to turn off the main power and unplug the power cord or remove the battery.

Battery Case

1. Remove the top panel and bottom panel.
2. Disconnect the connector CN915 from the MB-825 board. While releasing the FASTON terminal lock, disconnect the FASTON terminal CN932 from the MB-825 board.
3. Remove the four screws (B3 × 6) and remove the battery case.
4. Disconnect the FASTON terminal from CN422 on the FU-76 board.
5. Remove the battery case from the unit.

Top Panel

Loosen the four coin screws and move the top panel in the direction of the arrow to remove it.

Front Cover

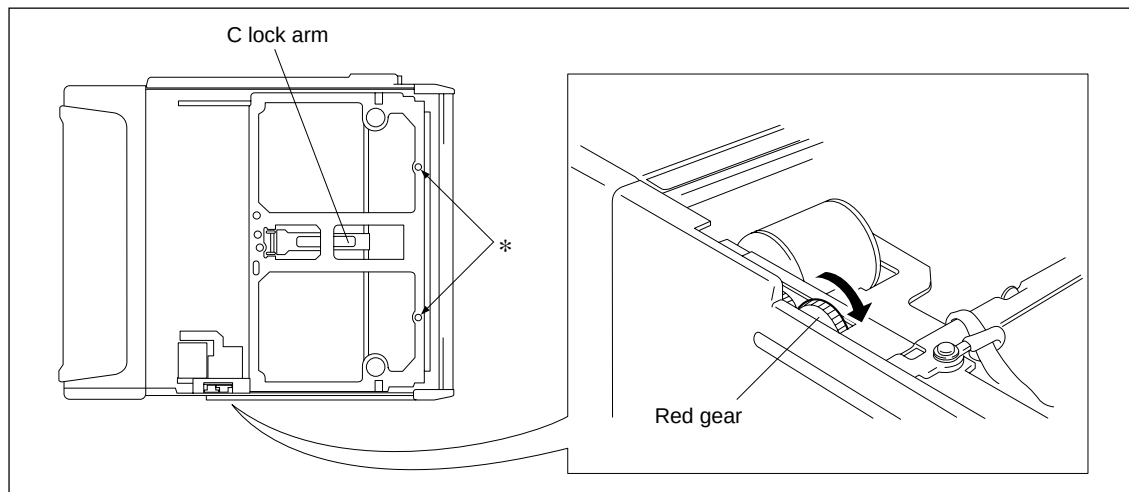
Remove the two screws (B3 × 6) and remove the front cover.

Front Panel

1. Remove the front cover.
2. While lifting up the C lock arm of the cassette compartment by fingers, rotate the red gear in the direction of the arrow (front panel side) and slide the cassette compartment by about 10 to 20 mm. Remove the two screws (B3 × 6) and the two washers at the position marked * in the following figure.

Note

The washers are also removed in the above procedure; keep the washers removed.



3. Remove the three screws (B3 × 6) of the front panel from the bottom panel side.
4. Remove the four knobs and remove the front panel.
Switch cover can sometimes drop. Be careful not to lose it.

Reinstallation Precaution

After reattaching the front panel, check to see that the switch cover is installed with it.

Handle

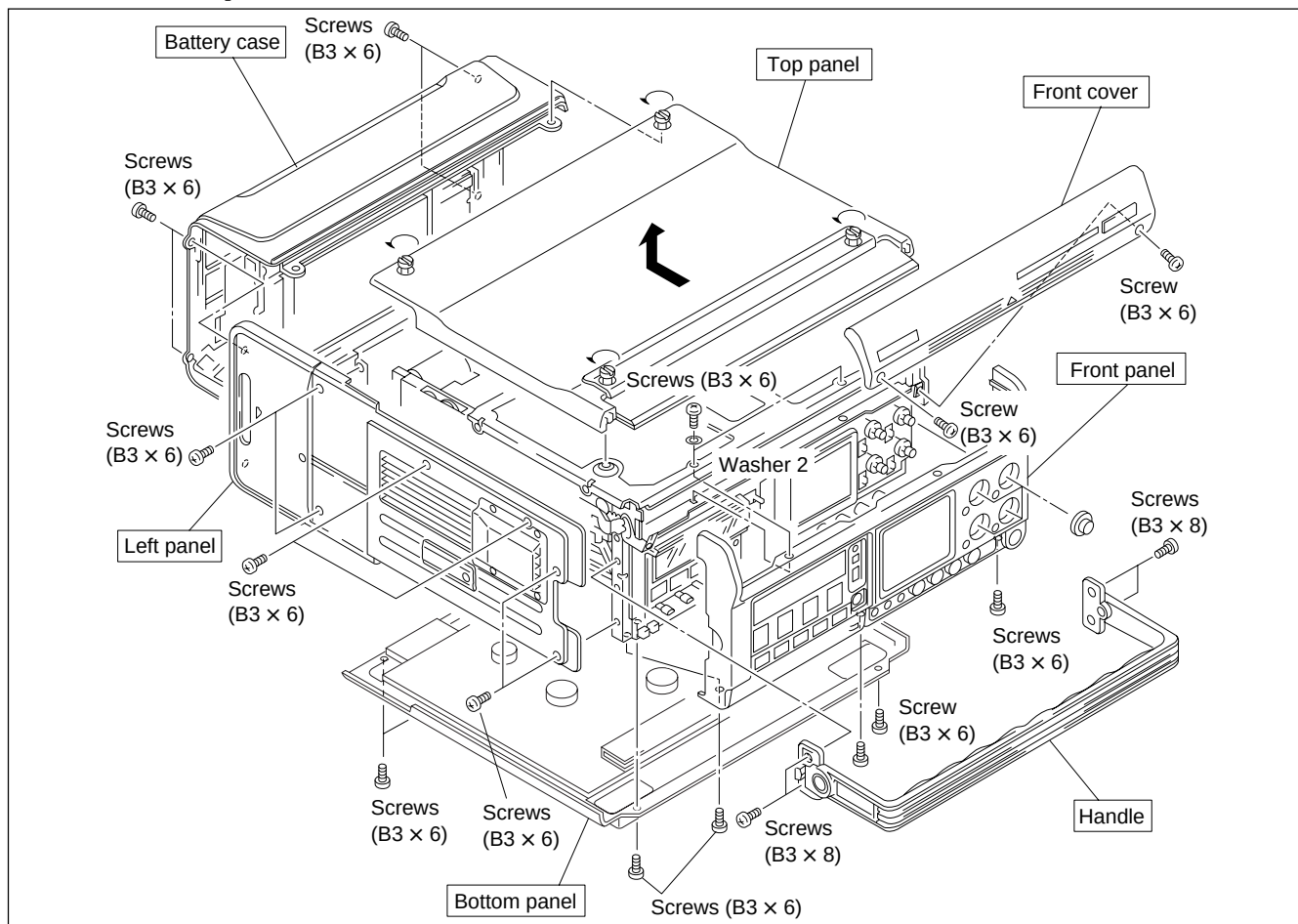
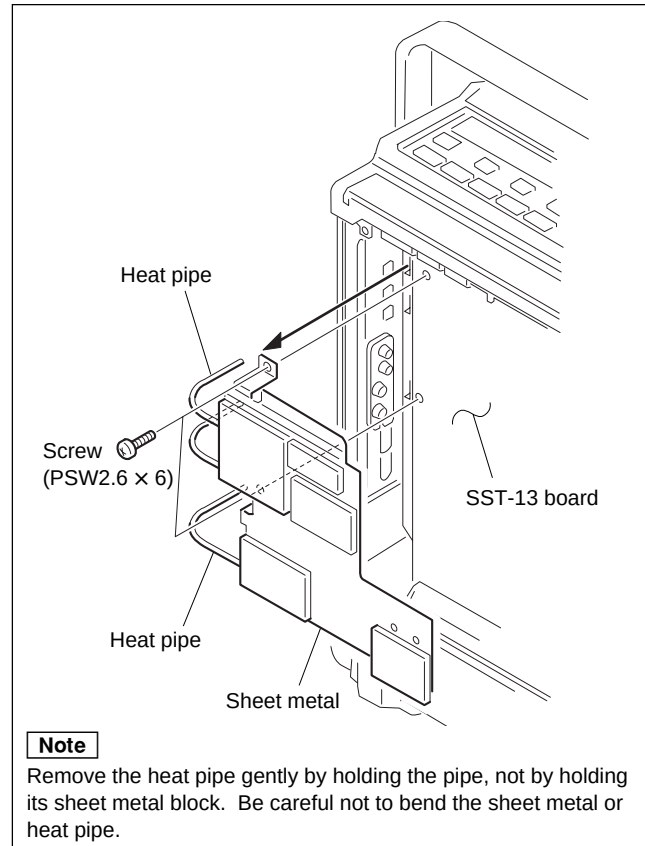
1. Remove the front panel.
2. Remove the four screws (B3 × 8) and remove the handle.

Bottom Panel

1. Remove the four screws (B3 × 6).
2. Disconnect the connector CN1 of the CN-1926 board that is installed on the bottom panel.
3. Remove the bottom panel.

Left Panel

1. Remove the top panel, handle, front panel and battery case.
2. Remove the cassette compartment. (Refer to Section 1-6.)
3. Remove the bottom panel.
4. Remove the two screws ($B3 \times 6$) and open the VPR-53 board.
5. Disconnect the connectors CN206, CN207, CN208, CN214, CN215 and CN216 of the VPR-53 board.
6. Disconnect the connector J2 of the DCP-22 board.
7. Remove the two screws ($PSW2.6 \times 6$) and remove the heat pipe from the SST-13 board.
8. Disconnect the connector CN119 of the SST-13 board.
9. Remove the four screws ($B3 \times 6$) of the left panel.
10. Remove the left panel.



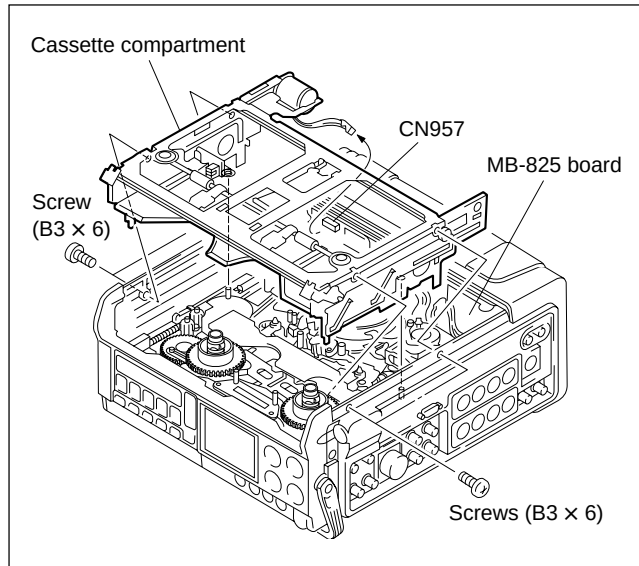
1-6. Removing and Reinstalling the Cassette Compartment

CAUTION

Before performing the following procedure, be sure to turn off the main power and unplug the power cord or remove the battery.

Removal

1. Move the reel table to the center position.
(Refer to Maintenance Manual Part 2, Volume 1.)
2. Remove the four screws (B3 × 6) on the sides of the unit.
3. Disconnect the connector CN957 (connected to the motor) from the MB-825 board.
4. Remove the cassette compartment.



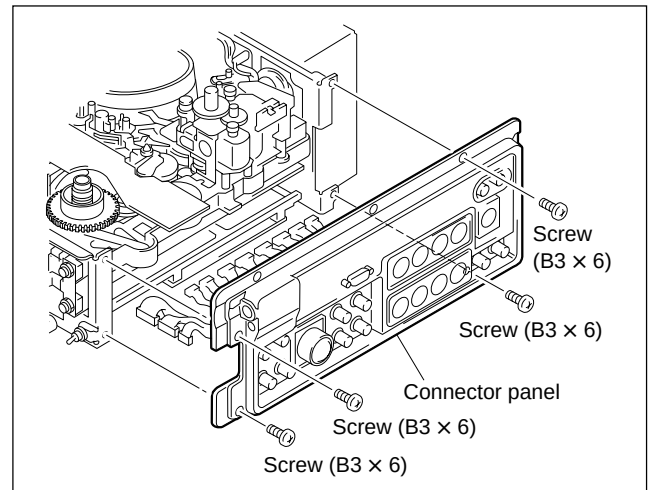
Reinstallation Precautions

- When reattaching the cassette compartment to the unit, be careful not to pinch the harness that connects the connector panel and the front panel.
- Reattach the cassette compartment to the chassis so that the two cassette guide pins go through the round hole of the stage.

1-7. Removing and Reinstalling the Connector Panel

Removal

1. Remove the top panel, handle, front panel, bottom panel, battery case and cassette compartment. (Refer to Section “1-5. Removing and Reinstalling the Cabinet” and Section “1-6. Removing and Reinstalling the Cassette Compartment”.)
2. Disconnect the connectors CN551, CN552 and CN553 of the ADA-44 board, and remove the clumper.
3. Remove the video board assembly.
(Refer to Maintenance Manual Part 2, Volume 1.)
4. Disconnect the connectors CN101, CN105, CN106, CN108 to CN110, CN112 and CN113 of the SST-13 board.
5. Disconnect the connectors CN921, CN923 and CN930 of the MB-825 board and disconnect the connectors CN601 and CN912 of the DC/DC converter.
6. Remove the four screws (B3 × 6) and remove the connector panel.

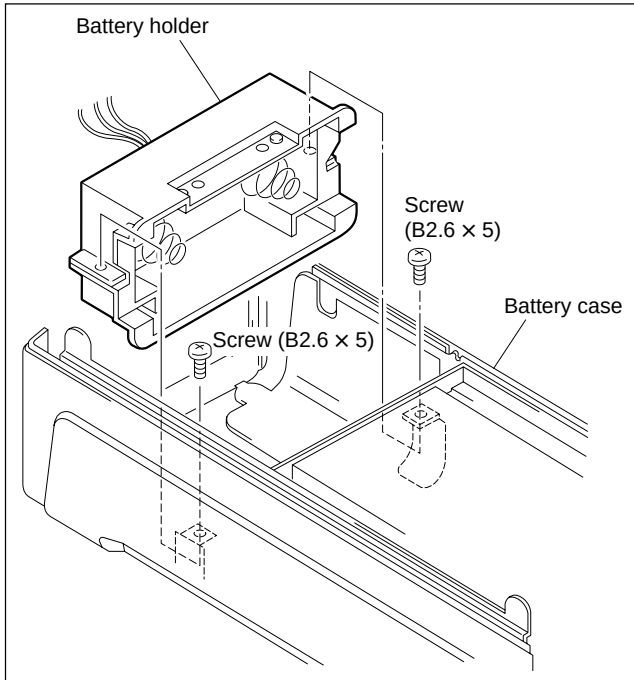


Reinstallation Precaution

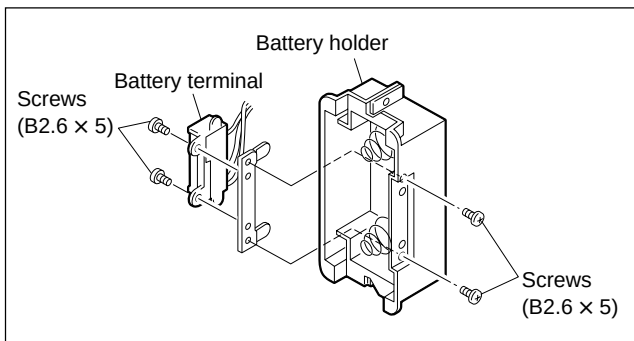
After reattaching the connector panel, perform the tape run adjustment. (Refer to Maintenance Manual Part 2, Volume 1.)

1-8. Replacing the Battery Terminal

1. Remove the battery case. (Refer to Section “1-5. Removing and Reinstalling the Cabinets”.)
2. Remove the two screws (B2.6 × 5) and remove the battery holder.



3. Remove the four screws (B2.6 × 5) and replace the battery terminal.

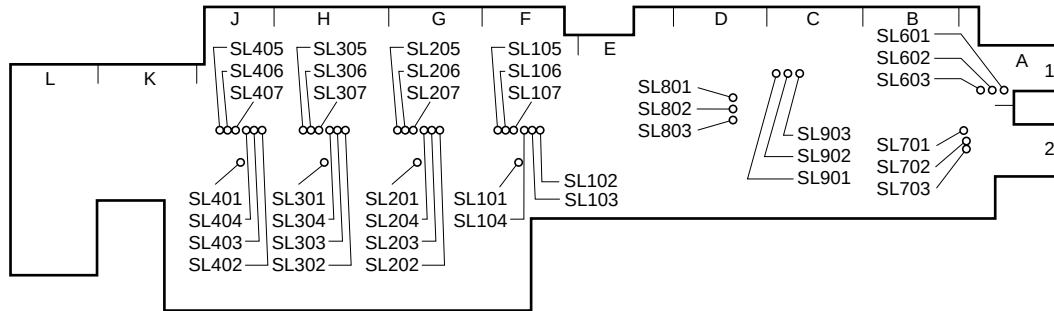


1-9. Setting Switches and Slit Lands on the Boards

Note

Never change the settings of the factory-use switches.

1-9-1. CP-337 Board



CP-337 B SIDE

Sets the audio input level when the audio input level switch (−60/−20/+4 dB selectable) on the connector panel is set to −60. (−60 dBu or −40 dBu selectable by slit land setting. Factory setting: −60 dBu)

Audio Channel	Ref No.	Input level (dBu)	
		−60	−40
CH-1	SL101	SHORT	OPEN
CH-2	SL201	SHORT	OPEN
CH-3	SL301	SHORT	OPEN
CH-4	SL401	SHORT	OPEN

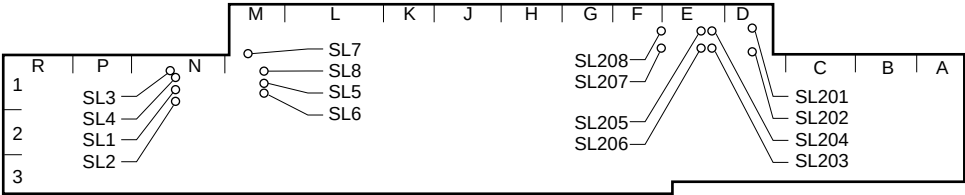
Sets the audio input level when the audio input level switch (−60/−20/+4 dB selectable) on the connector panel is set to +4. (+4, 0 or −3 dBu selectable by slit land setting. Factory setting: +4 dBu)

Audio Channel	Ref No.	Input level (dBu)		
		4	0	−3
CH-1	SL102 SL105	OPEN	OPEN	SHORT
	SL103 SL106	OPEN	SHORT	OPEN
	SL104 SL107	SHORT	OPEN	OPEN
CH-2	SL202 SL205	OPEN	OPEN	SHORT
	SL203 SL206	OPEN	SHORT	OPEN
	SL204 SL207	SHORT	OPEN	OPEN
CH-3	SL302 SL305	OPEN	OPEN	SHORT
	SL303 SL306	OPEN	SHORT	OPEN
	SL304 SL307	SHORT	OPEN	OPEN
CH-4	SL402 SL405	OPEN	OPEN	SHORT
	SL403 SL406	OPEN	SHORT	OPEN
	SL404 SL407	SHORT	OPEN	OPEN

Sets the audio output level. (+4, 0 or −3 dBm selectable by slit land setting. Factory setting: +4 dBm)

Audio Channel	Ref No.	Output level (dBm/600 Ω)		
		4	0	−3
CH-1	SL601	SHORT	OPEN	OPEN
	SL602	OPEN	SHORT	OPEN
	SL603	OPEN	OPEN	SHORT
CH-2	SL701	SHORT	OPEN	OPEN
	SL702	OPEN	SHORT	OPEN
	SL703	OPEN	OPEN	SHORT
CH-3	SL801	SHORT	OPEN	OPEN
	SL802	OPEN	SHORT	OPEN
	SL803	OPEN	OPEN	SHORT
CH-4	SL901	SHORT	OPEN	OPEN
	SL902	OPEN	SHORT	OPEN
	SL903	OPEN	OPEN	SHORT

1-9-2. ADA-44 Board



ADA-44 B SIDE

For selecting headroom level (Factory setting: 20 dB)

Ref No.		Headroom (dB)		
		20	18	16
REC CH-1	SL1	OPEN	SHORT	OPEN
	SL2	OPEN	OPEN	SHORT
REC CH-2	SL3	OPEN	SHORT	OPEN
	SL4	OPEN	OPEN	SHORT
REC CH-3	SL5	OPEN	SHORT	OPEN
	SL6	OPEN	OPEN	SHORT
REC CH-4	SL7	OPEN	SHORT	OPEN
	SL8	OPEN	OPEN	SHORT
PB CH-1	SL201	OPEN	SHORT	OPEN
	SL202	OPEN	OPEN	SHORT
PB CH-2	SL203	OPEN	SHORT	OPEN
	SL204	OPEN	OPEN	SHORT
PB CH-3	SL205	OPEN	SHORT	OPEN
	SL206	OPEN	OPEN	SHORT
PB CH-4	SL207	OPEN	SHORT	OPEN
	SL208	OPEN	OPEN	SHORT

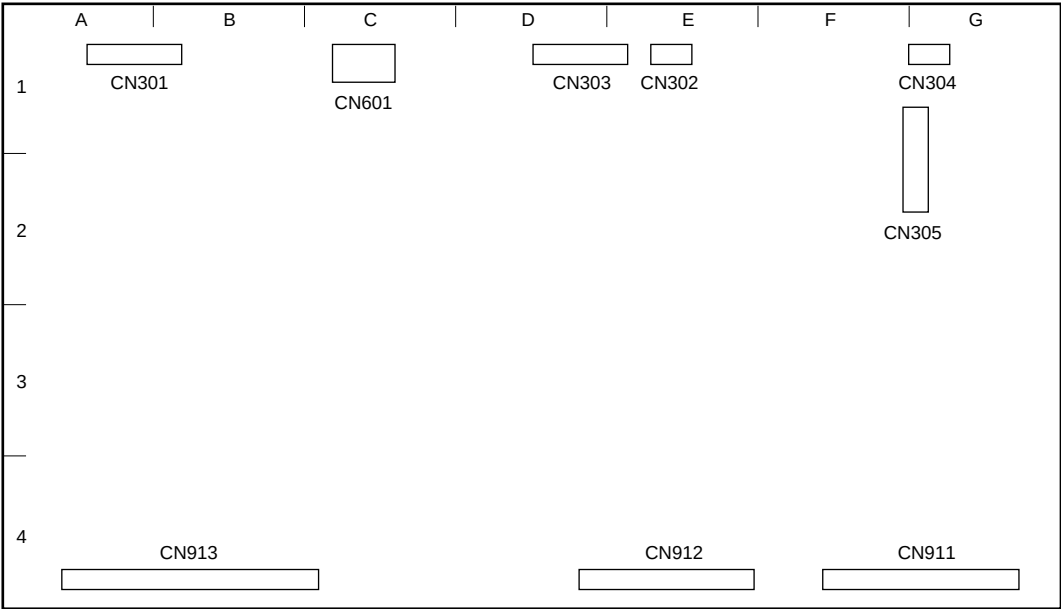
1-9-3. DCP-22 Board



DCP-22 A SIDE

Ref. No.	Name	Description	Factory setting
S100-1	74 MHz PLL Enable switch	ON : Normal use OFF : Boundary ScanTest	ON
S100-2	27 MHz PLL Enable switch	ON : Normal use OFF : Boundary ScanTest	ON
S100-3	PLD Programming Enable switch	ON : Normal use OFF : Boundary ScanTest	ON
S100-4	Not used		OFF

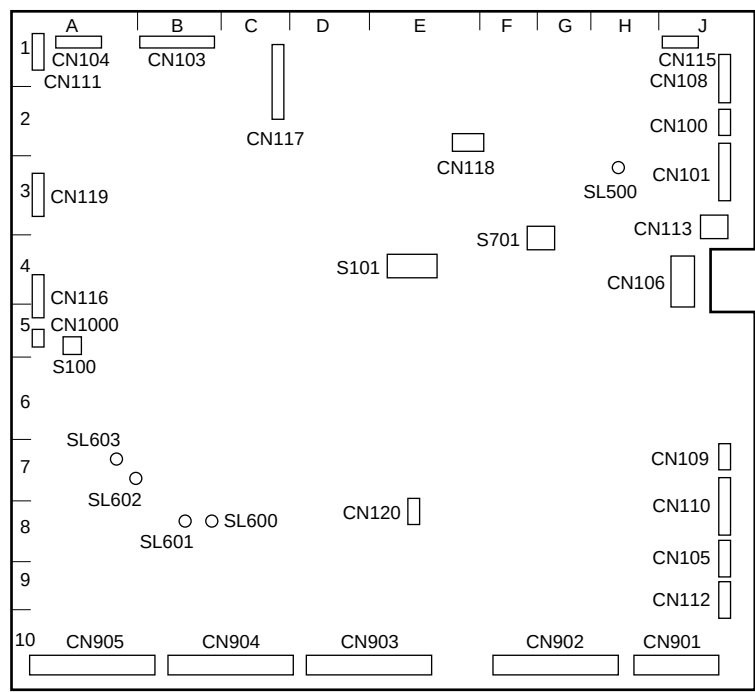
1-9-4. EQ-76 Board



EQ-76 A SIDE

Ref. No.	Name	Description	Factory setting
S601-1	R/P ENV switch	Used during tape path adjustment ON : Enables the R/P envelope detection and turn off the power of both the EQ-76 board and the drum OFF : Normal use	OFF
S601-2	—	Factory use	OFF
S601-3	—	Factory use	OFF
S601-4	—	Factory use	OFF

1-9-5. SST-13 Board



SST-13 A SIDE



Ref. No.	Name	Description	Factory setting
S100	RESET switch	For resetting SYSTEM CONTROL CPU	—
S101	—	Factory use	1, 3 : ON 2, 4 to 8 : OFF
S701	—	Factory use	1 to 3 : OFF 4 : ON
SL500	—	OPEN : IF block power supply control SHORT : IF block is turned ON all the time	OPEN
SL600	—	OPEN : +5 V of SYS and SV is opened SHORT : +5 V of SYS and SV is shorted	OPEN
SL601	—	OPEN : +5 V of longitudinal system and SV is opened SHORT : +5 V of longitudinal system and SV is shorted	SHORT
SL602	—	OPEN : -5 V of SYS and SV is opened SHORT : -5 V of SYS and SV is shorted	OPEN
SL603	—	OPEN : -5 V of longitudinal system and SV is opened SHORT : -5 V of longitudinal system and SV is shorted	SHORT

1-10. Ejecting the Cassette Tape Manually

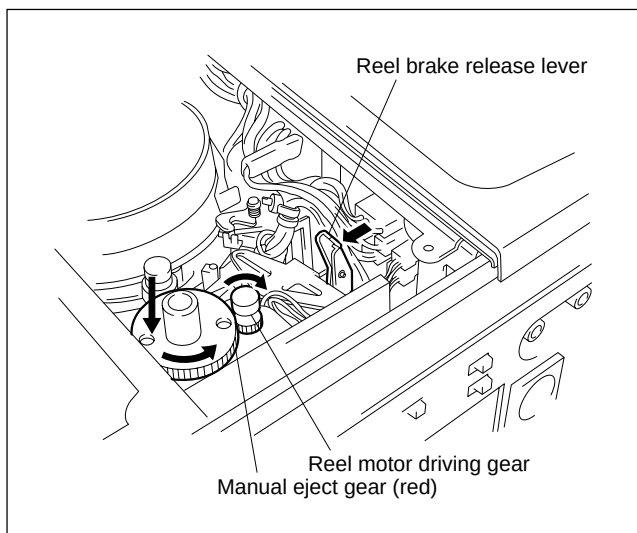
If a cassette tape cannot be ejected or the cassette compartment does not rise up due to some troubles, remove the cassette tape manually from the unit as follows:

CAUTION

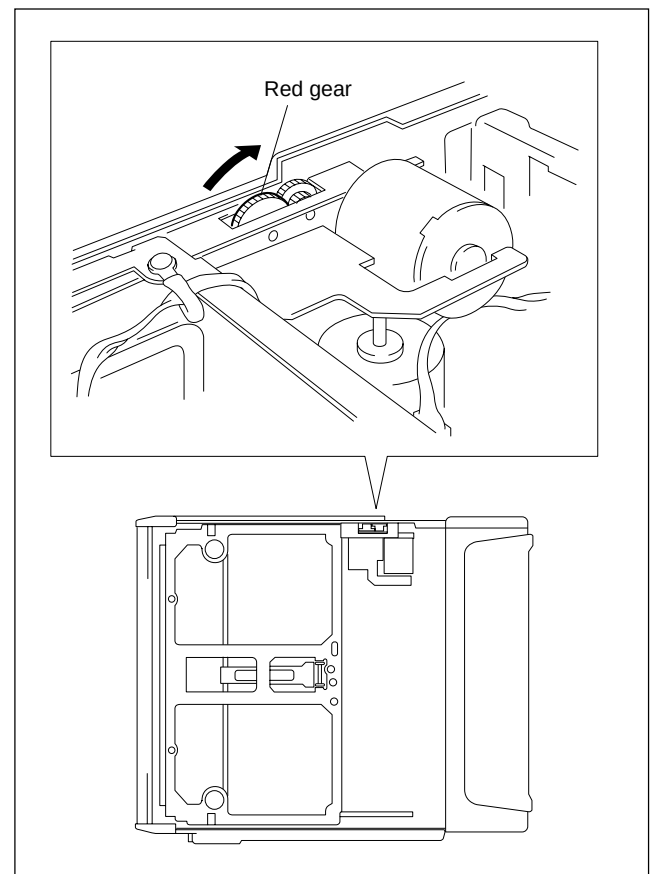
Before performing the following procedure, be sure to turn off the main power and unplug the power cord from the unit.

1. Remove the top panel. (Refer to Section “1-5. Removing and Reinstalling the Cabinets”.)
2. Pull the reel brake release lever in the direction of the arrow, and while pushing the manual eject gear (red) rotate it counterclockwise until the gear stops rotating to roll up the tape into the cassette.

When the tape cannot be rolled up, pull the reel brake release lever and rotate the reel motor driving gear clockwise to roll up the tape into the cassette.



3. Rotate the red gear shown below in the direction of the arrow to raise up the cassette compartment and eject the cassette tape.



1-11. Cleaning when the Heads are Clogged

For details on how to clean the video head, refer to Section “5-2-3. Cleaning the Tape Running Surface of the Upper Drum and Video Heads”.

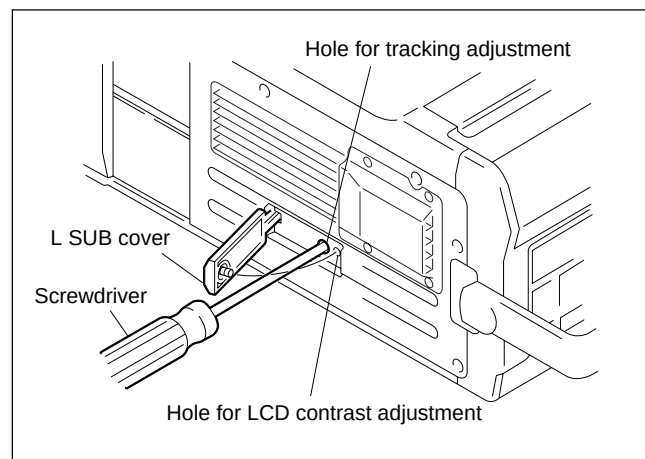
The video heads should be cleaned periodically to avoid head clogging.

1-12. Tracking Adjustment and Audio Meter Brightness Adjustment

1-12-1. Tracking Adjustment

To adjust the tracking, perform the following procedure.

1. Perform the following operations in the setup menu. (Refer to Section 3-1.)
PAGE : <TRACKING>
ITEM : AUTO TR → OFF
2. Remove the screw and open the L SUB cover.
3. Insert the screwdriver tip into the hole for tracking adjustment and adjust the tracking.



1-12-2. Audio Meter Brightness Adjustment

To adjust the audio meter brightness, perform the following procedure.

1. Remove the screw and open the L SUB cover.
2. Insert the screwdriver tip into the hole for LCD contrast and adjust the LCD brightness.

1-13. Optional Accessories

1-13-1. Optional Accessories

Carrying case :	HKDW-250
Battery :	BP-L60A
	BP-90A
AC adapter :	AC-550, AC-DN2A
Battery charger :	BC-L100
Video cassette tape :	BCT-HD series
Camera remote controller :	RM-B150
Memory label :	MLB-1B-100

1-13-2. Tools for Adjustment

Note

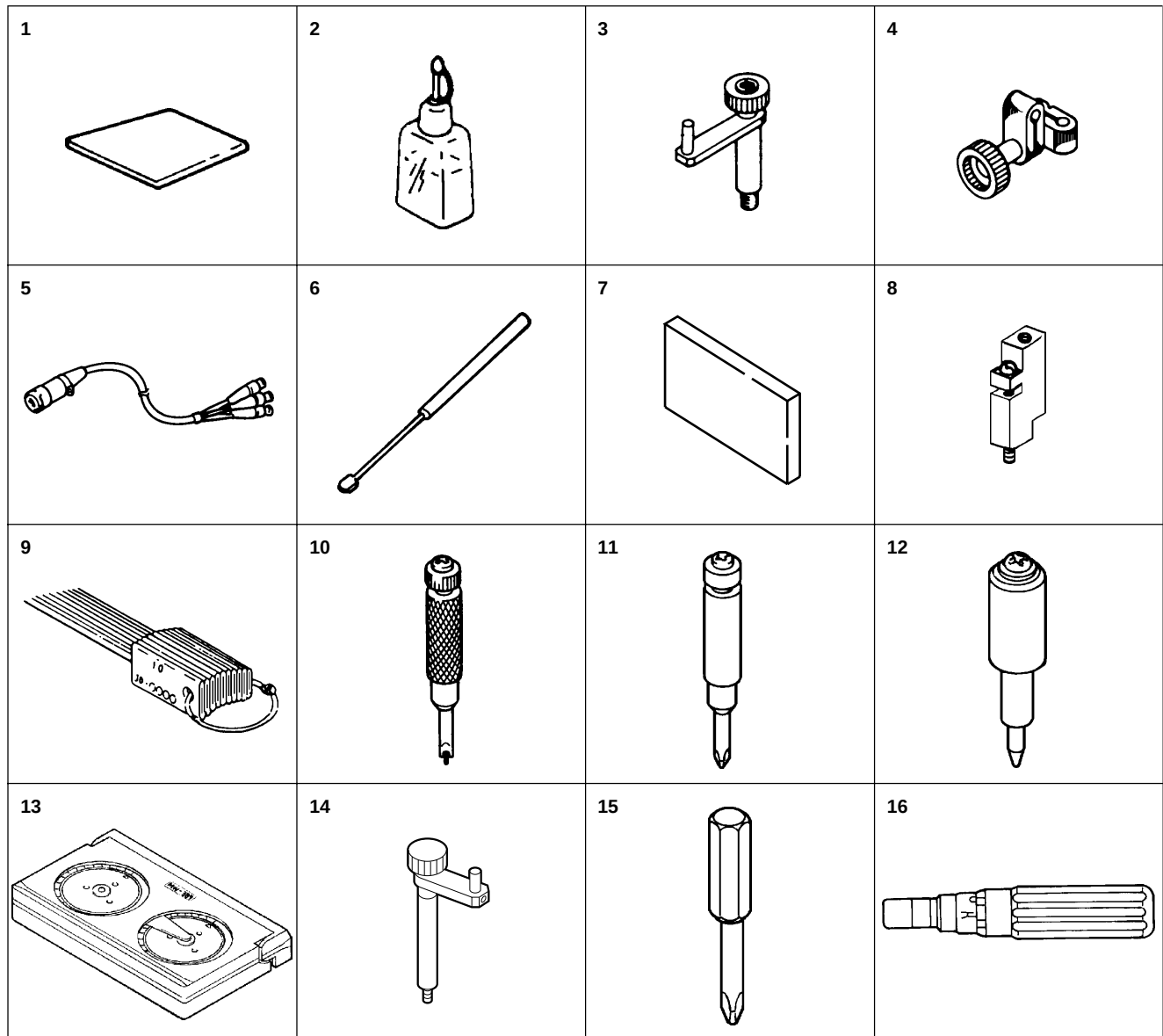
The tools of Fig. No. 3 and higher that are shown in the attached table, are not used in this manual. If they are necessary, refer to the Maintenance Manual Part 2, Volume 1.

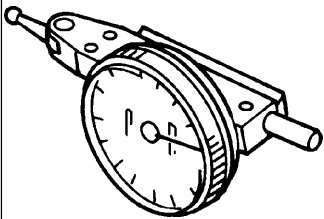
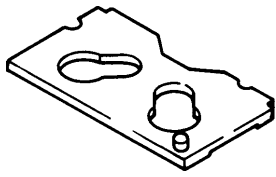
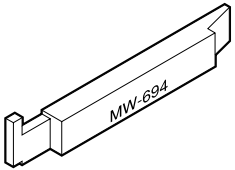
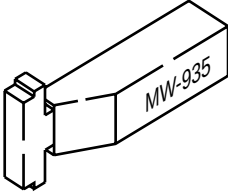
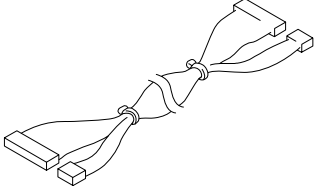
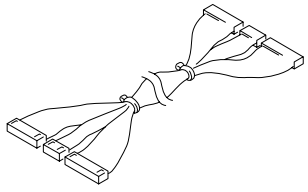
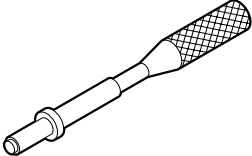
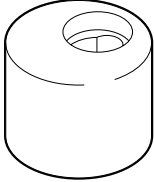
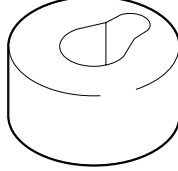
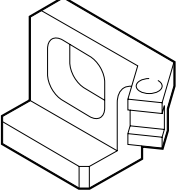
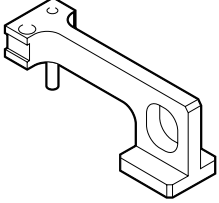
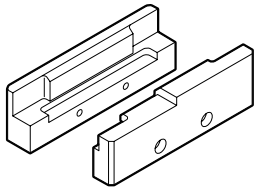
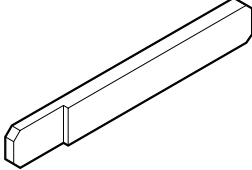
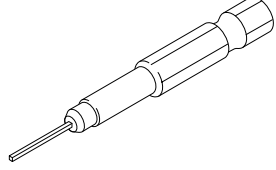
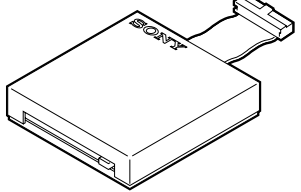
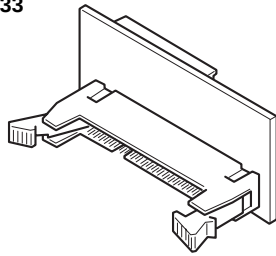
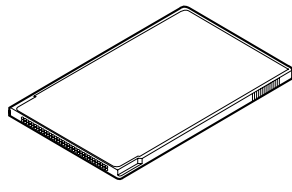
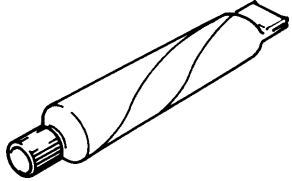
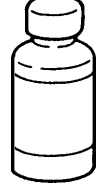
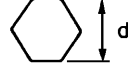
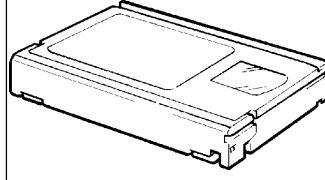
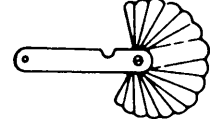
Fig. No.	Part No.	Description	Used for
1	3-184-527-01	Cleaning Cloth	Cleaning
2	9-919-573-01	Cleaning Liquid	
	Commercially available	Cleaning Tape (BCT-HD12CL)	

The following equipment is used in the Maintenance Manual Part 2, Volume 1 only.

Fig. No.	Part No.	Description	Used for
3	J-6001-820-A	Drum Eccentricity Adjustment (3)	Adjusting the upper drum eccentricity
4	J-6001-830-A	Drum Eccentricity Adjustment (2)	
5	J-6031-840-B	Multi Connector Cable (CIBNC)	Adjusting the video system
6	J-6080-840-A	Mirror (Small Oval Type)	Adjusting the tape path
7	J-6086-570-A	Reference Flat Plate	Adjusting audio/TC head zenith
8	J-6087-000-A	Drum Eccentricity Adjustment (5)	Adjusting the upper drum eccentricity
9	J-6152-450-A	Wire Clearance Check Gauge	Checking the clearance
10	J-6321-500-A	Tape Guide Adjustment Driver	Adjusting the tape guide height
11	J-6322-420-A	Driver (Tool) TG Adjustment (45)	Adjusting the tape path
	J-6322-420-3	Tool, 0.89 Bit (for repairing)	
12	J-6323-530-A	Stop Washer Fastening Tool	Installing the stop washer
13	J-6323-890-A	Torque Cassette (FWD back ten)	Adjusting the FWD back tension
14	J-6324-030-A	Drum Eccentricity Adjustment (7)	Adjusting the upper drum eccentricity
15	J-6325-110-A	Torque Screwdriver Bit (For M1.4)	Tightening screws
	J-6325-380-A	Torque Screwdriver Bit (For M2)	
16	J-6325-400-A	Torque Screwdriver Bit (3 kg/cm)	
17	J-6325-530-A	Drum Eccentricity Adjustment (6)	Adjusting the upper drum eccentricity
18	J-6326-120-A	Hexagon Bit (For Torque Driver) (S:1.5)	Tightening screws
19	J-6326-530-A	Cassette Reference Plate	Adjusting the reel table height
20	J-6326-940-A	S-side Gauge	Adjusting S4 guide height
21	J-6329-350-A	Reel Table Height Gauge (MW-935)	Adjusting the reel table height
22	J-6510-400-A	Extension Harness (VIDEO)	Repairing boards
23	J-6421-440-A	Extension Harness (AUDIO)	
24	J-7031-030-A	S-Tension Arm Positioning Tool	Adjusting the positioning of parts
25	J-7031-040-A	Weight for S-Tension Adj. (W76.7)	Adjusting the amount of part movement
26	J-7031-050-A	Weight for S-Tension Adj. (W44)	
27	J-7031-260-A	Master Block (T2)	Checking the tape guide slant
28	J-7031-270-A	Master Block (S2)	
29	J-7031-280-A	S-tension Adjusting Table	Adjusting the tension regulator
30	J-7031-450-A	END Sensor Positioning Tool	Adjusting the positioning of parts
31	J-7031-460-A	Bit for Torque Driver (S:1.27)	Fastening screws
32	A-8319-485-A	Memory Card Box, CDS-20 Assembly	For updating software

Fig. No.	Part No.	Description	Application
33	A-8322-838-A	Conversion connector for software update	For updating software
34	1-772-003-11	Memory Card (2 MB) MB98A81183	For updating software
35	7-651-000-10	Silicone Grease SGL-601 (50 g)	Lubricating
	7-651-000-11	Silicone Grease SGL-801 (50 g)	
36	7-661-018-18	Diamond Oil NT-68 (Mitsubishi diamond oil hydro-fluid) (50 ml)	
37	7-700-736-05	L Shaped Hex. Wrench (d = 1.5 mm)	Removing screws
	7-700-736-06	L Shaped Hex. Wrench (d = 0.9 mm)	
38	8-960-076-01	Alignment tape HSR5-1A	Adjusting the video/audio system
	8-960-076-11	Alignment tape HSR2-1A	Adjusting the video tracking
39	9-911-053-00	Thickness Gauge	Checking the clearance
Commercially available	Head Demagnetizer		Demagnetizing head
	Blank Tape BCT-40HD		Adjusting the tape running and
	Blank Tape BCT-124HDL		adjusting the RF system



17	18	19	20
			
21	22	23	24
			
25	26	27	28
			
29	30	31	32
			
33	34	35	36
			
37	38	39	
 			

Section 2

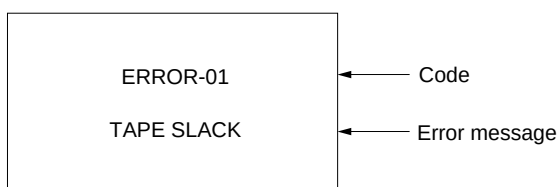
Error Messages and Error Logs

2-1. Error Messages

The unit has a self-diagnostic function which detects abnormalities of the unit.

When an error is detected, error code and error message are displayed immediately on the audio meter LCD on the front panel.

Audio meter LCD



Code	Error message	Description
01	TAPE SLACK	Tape slack is detected during threading or unthreading
02	TAPE SLACK	Tape slack or tape breakage is detected during search, fast forward, or rewind mode
03	TAPE SLACK	Tape slack or tape breakage is detected during playback or record mode, or the mechanical lock of the supply or take-up reel is detected
04	TAPE TROUBLE	Tape does not run at the speed specified in fast forward or rewind mode
05	REEL NOT STOPPED	Supply or take-up reel is detected that it cannot be stopped while a cassette tape is not inserted. Or it is detected that an over-current flows in the supply or take-up reel motor
06	TAPE TENSION ERROR	Excess tension is detected
07	CAPSTAN FG ERROR	Tape does not run at the speed specified in fast forward or rewind mode
08	DRUM FG ERROR	It is detected that drum motor rotation is abnormal
09	THREAD/UNTHREAD ERROR	It is detected that threading or unthreading is not completed within the specified time
0A	THREAD/UNTHREAD SENSOR	It is detected that threading cannot be implemented
0B	CASSETTE COMPARTMENT UP/DOWN SENSOR	It is detected that threading cannot be implemented
0C	THREAD/UNTHREAD AND UP/DOWN SENSOR	It is detected that threading cannot be implemented
10	HUMID	Condensation is detected After the message disappears, check that there is no condensation before starting using the unit
11	TAPE TOP/END SENSOR	Tape top and tape end are detected at the same time
12	TAPE TOP SENSOR	It is detected that tape top sensor operation is defective
13	TAPE END SENSOR	It is detected that tape end sensor operation is defective
14	FAN TROUBLE	An abnormality is detected in the cabinet cooling fan
20	CASSECOM MOTOR LOCKED	It is detected that cassette up/down operation is not completed within the specified time
97	SV NVRAM ERROR	Checksum error occurs in the NV-RAM for servo IC605/SST-13 board
A0	READ WRITE ERROR	Error occurs during reading and writing to and from the RAM on the SY (SST-13 board) • MAIN SRAM • MAIN IF • MAIN SV • IC113, IC114, IC115, IC116 • IC513 • IC400
C1	TG NO RESPONSE	The frame pulse from the TG on the processor has stopped
C2	SV NO RESPONSE	Servo operation is stopped
C3	FUSE BLOWN	The fuse in the camera power supply has blown
C4	BATTERY END	The supply voltage has decreased and the operation cannot be implemented Replace the battery, and then turn on the main power again

2-2. Error Logs

The unit has the logging function to log the detected errors (ERROR, WARNING and CONDITION) besides the self-diagnostic function to detect the abnormalities of the unit.

The error log can be checked from <ALARM> – <ERROR LOG> – LOG in the DIAG menu.

In addition, the LOG display is added to one of the LCD displays to be selected using the MENU key by turning on the setting of <DISPLAY SELECT> – ERROR LOG of the SYSTEM in the setup menu.

Displaying and logging of the WARNING items are selectable by setting from <ALARM> – <ERROR LOG> – CANCEL EDIT in the DIAG menu.

The items to be logged are as follows:

ERROR

Refer to Section “2-1. Error Messages”.

WARNING

Item	Description
BATTERY NEAR END	The battery voltage has reached the warning setup value (It is set by the DIAG (ALARM) menu)
CAMERA DC SUPPLY OFFED	Power supply to the camera has stopped because a BP-90A is used as the power supply to the camera
CAMERA DC SUPPLY ON WITH BP90	The power supply setting to the camera is turned ON even though a BP-90A is inserted
INVARID SDI	Data of the serial digital input signal is not valid
LOST LOCK	Capstan servo loop has unlocked during recording or playback or editing
NO CAM INPUT	CAMERA INPUT is selected as the reference signal but no input signal is fed
NO EXT REFERENCE	A reference input signal has been set. However, no input signal is supplied to the selected reference input so that the unit operates on the internal reference signal
NO LTC REPRODUCED	LTC signal is not recorded on tape
NO SDI INPUT	SDI input is selected as the reference signal but no input signal is supplied
NO PB RF	The playback head does not read out the digital data from the tape
ASM IN ERROR	Continuity of the recorded data on a tape is lost due to the cause that the pre-recorded tape has already the discontinuity of the pre-recorded data in its pre-roll segment before implementing the assemble edit or auto assemble mode, or due to the cause that the recording starting point has been specified on a tape
TAPE END	Tape has reached its tape end
TAPE NEAR END	Tape has reached its near end. (Remaining amount of tape is scarce)
VIDEO PLL UNLOCKED	The video clock generator PLL does not lock in with the video reference signal

CONDITION

Item	Description
AUDIO ERROR	Deterioration in the quality of audio playback signal
VIDEO ERROR	Deterioration in the quality of video playback signal

Refer to “A-1 Warning Display and Countermeasures” of Operation Manual for the measures against the warning displays when abnormality occurs.

Section 3

Maintenance Mode

3-1. Setup Menu

The unit has the setup menu required for setting the functions and others.

This menu has the hierarchical structure. The PAGE sub-menu is characterized as it is surrounded by the triangle bracket < >.

Operation

1. Starting up the setup menu

Press the DISPLAY button once or twice until the setup menu appears on the audio meter LCD.

2. Selecting the desired item to set

Move the asterisk * (cursor) using the UP or DOWN button to select the desired item to set.

When an item is selected, press the SET button.

When the UP or DOWN button is kept pressed, the cursor can move swiftly in units of category.

3. Setting the ITEM

Change the data of the selected setup item by pressing the UP or DOWN button.

Press the SET button to register and save the changed value.

4. Exiting the setup menu

Press the DISPLAY button several times.

Category item	Setup item	Display on LCD
VTR CONTROL	SERVO A/V REFERENCE SELECT	SV/AV REF
	EXTERNAL REFERENCE SELECT	EXT REF
	STILL TIMER	STILL TMR
	SEARCH SPEED	SEARCH
	FREEZE MODE	FREEZE
EDIT	REC MODE	REC MODE
	PREROLL TIME	PREROLL
TIME CODE	REC RUN	REC RUN
	EXTERNAL TC IN	EXT TC IN
	PHASE CORRECTION	PHASE CRC
	TCG CF FLAG	TCG CF FLG
	TC OUT	TC OUT
CHAR OUT	CHARACTER V POSITION	CHAR V
	CHARACTER TYPE	CHAR TYPE
	DISPLAY INFORMATION select	DISP INFO
	CHAR WARNING DISPLAY at dual line mode	CHAR WANG
	REMAIN TIME	REMAIN TM
VITC (NTSC)	VITC (NTSC)	VITC/NTSC
	VITC POSITION-1 select (NTSC)	VITC POSI1
	VITC POSITION-2 select (NTSC)	VITC POSI2

Category item	Setup item	Display on LCD
VIDEO (HD)	SDI OUT	SDI OUT
	MASTER LEVEL	MSTR LEV
	Y LEVEL	Y LEVEL
	P _B LEVEL	PB LEVEL
	P _R LEVEL	PR LEVEL
	SETUP LEVEL	SETUP LEV
	SYNC PHASE	SYNC PHSE
	FINE	FINE
	ROUNDING	ROUNDING
VIDEO (NTSC)	DOWNCONVERTER OUT	D. CONV OUT
	DOWNCONVERTER MODE	D. CONV MOD
	H CROP POSITION	H CROP PS
	SETUP LEVEL (NTSC)	SETUP NTS
	SYNC PHASE (NTSC)	SYNC NTSC
	FINE (NTSC)	FINE NTSC
AUDIO	INPUT 1/2	INPUT 1/2
	INPUT 3/4	INPUT 3/4
	EMPHASIS	EMPHASIS
	DOUBLE REC	DOUBLE REC
	PB VOLUME	PB VOLUME
SYSTEM	VIDEO TEST SG	V TEST SG
	AUDIO TEST SG	A TEST SG
	CAMERA POWER SUPPLY	CAM POWER
	<DISPLAY SELECT>	
	IN/OUT SIGNAL	IN/OUT SIG
	INFORMATION	INFORMATI
	ERROR LOG	ERROR LOG
	RF CHECK	RF CHECK
	CHANNEL CONDITION	CHANNEL
	<LOAD/SAVE>	
	LOAD	LOAD
	<SAVE> — SAVE	SAVE
	<REMOTE>	
	REMOTE	REMOTE
	BAUD RATE	BAUD
	CAMERA REMOTE	CAM REMOT
	<SYSTEM>	
	FREQUENCY	FREQUENCY
	HD LINE	HD LINE
TRACKING	AUTO TRACKING	AUTO TRACK



VTR CONTROL

Display on LCD	Setup item	Setup value	Description
SV/AV REF	SERVO A/V REFERENCE SELECT	INP EXT	Select the servo reference signal using this menu. INP : The input signal that is input to either the CAMERA connector or the SDI IN connector and is selected by the VIDEO INPUT SELECTOR switch on the connector panel, is selected as the servo reference signal. EXT : An externally input signal is forcibly selected as the servo reference signal. However, when no input signal is connected to the REFERENCE IN connector, servo systems operate on internal reference signal.
EXT REF	EXTERNAL REFERENCE SELECT	HD NTSC	When the EXT position is selected by the SERVO A/V REFERENCE SELECT item, any of the input signals that are connected to the REFERENCE IN connector is selected as the reference signal on which the entire system of the unit operates. HD : Either 1125/59.94 or 1125/60 signal of both the positive and negative polarity sync signals that is input to the REFERENCE IN connector, is selected as the reference signal of playback mode and audio signal recording mode. Either 59.94 kHz or 60 kHz sync signal is selected by the SYSTEM menu item "SYSTEM". (Refer to Section 6-3 of Operation Manual.) NTSC : Either the video signal with chroma and burst (VBS) or the B/W video signal (VS) that is input to the REFERENCE IN connector, is selected as the reference signal of playback mode and audio signal recording mode.
STILL TMR	STILL TIMER	0.5 sec 5 sec 10 sec 20 sec 30 sec 40 sec 50 sec 1 min 2 min 3 min 4 min 5 min 6 min 7 min 8 min 9 min 10 min 15 min 30 min	The unit enters automatically the tape protection mode when a specified time has elapsed after the unit enters the tape stop mode (stop mode or still picture mode of the SEARCH mode) in order to protect video head and tape from damage. This sub-menu is used to set the time until the unit enters the tape protection mode after it has entered the tape stop mode. Any period of time in the range of 0.5 seconds to 30 minutes can be set.
SEARCH	SEARCH SPEED	x2 x5 x8	The tape speed during SEARCH when the FF or REW button is kept pressed during the fast forward or fast rewind, is set. x2 : 2 times speed x5 : 5 times speed x8 : 8 times speed Note The tape speed during SEARCH when the FF or REW button is pressed at the same time with the FUNC button, advances in the order of 2 times speed → 5 times speed → 8 times speed whenever the FF or REW button is pressed, regardless of this setup.
FREEZE	FREEZE MODE	FLD FRM	Select a freeze mode during FREEZE. FLD : Picture freezes in the units of field. FRM : Picture freezes in the units of frame.

The items that are surrounded by square () in the Setup value column, show the default setting when shipped from the factory.

EDIT

Display on LCD	Setup item	Setup value	Description
REC MODE	REC MODE	CRUSH ASSEMBLE AUTO ASSEMBLE	Sets the type of record mode. CRUSH : The unit stops at the record end point. It re-starts next recording from the point. Continuity of the video signal is not maintained. ASSEMBLE : The unit stops after rewinding a tape for about three seconds from the record end point. It re-starts the next recording from the point. Continuity of the video signal is maintained. AUTO ASSEMBLE : The unit stops after rewinding a tape for about three seconds from the record end point. It re-starts the next recording from the point. Continuity of the video signal is maintained. The next recording starts automatically from the original 3-second-rewound point even though a tape is moved after the previous recording has ended as the tape is rewound as required.
PREROLL	PREROLL TIME	0 sec : 5 sec : 30 sec	Sets the pre-roll time from an external editing equipment that is connected to the REMOTE connector. A pre-roll time in the range of 0 to 30 seconds in units of 1 second can be set. A pre-roll time of 3 seconds or longer is used in general, but a pre-roll time of 5 seconds or more is recommended for editing using an external editing equipment.

The items that are surrounded by square () in the Setup value column, show the default setting when shipped from the factory.

TIME CODE

Display on LCD	Setup item	Setup value	Description
REC RUN	REC RUN	INT TAPE	Sets the type of time code signal that recorded on tape when the F-RUN/R-RUN switch is set in "R-RUN". INT : The time code signal that is generated by the internal time code generator is recorded. TAPE : The time code signal that is played back from a tape is recorded.
EXT TC IN	EXTERNAL TC IN	TC IN SDI	Selects the source of time code when the internal time code generator of the unit is locked to an external time code. TC IN : The internal time code generator of the unit is locked to the input signal connected to the TC IN connector. SDI : The internal time code generator of the unit is locked to the input signal connected to the SDI IN connector.
PHASE CRC	PHASE CORRECTION	OFF ON	Selects whether or not to control the phase compensation of the LTC data that is generated by the time code generator. OFF : Disables the phase compensation control. ON : Enables the phase compensation control.
TCG CF FLG	TCG CF FLAG	OFF ON	Selects to set (turns on) the color frame flag or not to set (turns off) the color frame flag in the un-used bit of the time code data. OFF : Turns off the color frame flag. ON : Turns on the color frame flag.
TC OUT	TC OUT	GEN AUTO	Selects the signal that is output to the TC OUT connector. GEN : The time code signal that is generated by the internal time code generator, is output. AUTO : The time code signal that is generated by the internal time code generator, is output during the record mode (including E-E mode). The LTC data that has already been recorded on tape, is output during the playback mode.

The items that are surrounded by square () in the Setup value column, show the default setting when shipped from the factory.

CHAR OUT

Display on LCD	Setup item	Setup value	Description
CHAR V	CHARACTER V POSITION	0 : 22 : 23	Sets the vertical position on the screen display of the character information such as time code that is output from the ANALOG HD COMPONENT (Y, P _B , P _R) connectors and the COMPOSITE (NTSC) connector when the SUPERIMPOSE switch on the front panel time code setting block, is set to the ON position. When 0 is set, the character information is displayed from the bottom end of the screen display. As the number of character increases, it moves upward. The numeral up to 23 can be set with 24 steps. Note When the two-line character display is specified by the sub-menu item "DISPLAY INFORMATION select", the characters of the second line can partially disappear on the center of the screen.
CHAR TYPE	CHARACTER TYPE	without BG outlined translucent with BG	Selects the character type of the character information such as time code that is output from the ANALOG HD COMPONENT (Y, P _B , P _R) connectors and the COMPOSITE (NTSC) connector when the SUPERIMPOSE switch on the front panel time code setting block, is set to the ON position. Without BG : White characters without background Outlined : White characters with black outline Translucent : White characters with translucent background BG : White characters with black background Note When "translucent" is selected, the output signal from the COMPOSITE connector is forced to be the "with BG" setup.
DISP INFO	DISPLAY INFORMATION select	time data & status time data & UB time data & CTL time data & time data time data only	Sets contents of the character information that is output from the ANALOG HD COMPONENT (Y, P _B , P _R) connectors and the COMPOSITE (NTSC) connector when the SUPERIMPOSE switch on the front panel time code setting block, is set to the ON position. time data & status : Timer counter display information and operating status time data & UB : Timer counter display information and user's bit time data & CTL : Timer counter display information and CTL time data & time data : Timer counter display information and VITC data time data only : Timer counter display information only
CHAR WANG	CHAR WARNING DISPLAY at dual line mode	OFF ON	Selects whether or not to display the warning message on the second line by blinking when the sub-menu item "DISPLAY INFORMATION select" is set to any positions other than "time data only". OFF : Warning message is not displayed by blinking. ON : Warning message is displayed by blinking when any warning message exists. Notes - The message that is canceled of its display, is not shown. * Refer to [Canceling the Warning Message Display] (on page A-6 of Operation Manual.) - When two or more messages exist at the same time, the first message is displayed by blinking twice then the other message is displayed by blinking.
REMAIN TM	REMAIN TIME	OFF ON 10 min	Sets whether or not to display the remaining amount of tape as the character information that is output from the ANALOG HD COMPONENT (Y, P _B , P _R) connectors and the COMPOSITE (NTSC) connector when the SUPERIMPOSE switch on the front panel time code setting block, is set to the ON position. OFF : Not displays remaining amount of tape. ON : Displays remaining amount of tape. 10 min : When the remaining amount of tape reaches 10 minutes or less, remaining amount of tape is displayed.

The items that are surrounded by square () in the Setup value column, show the default setting when shipped from the factory.

VITC (NTSC)

Display on LCD	Setup item	Setup value	Description
VITC/NTSC	VITC (NTSC)	☐ ON OFF	Sets whether or not to insert the VITC data into the down-converter output. ON : Inserts VITC data. OFF : Not inserts VITC data.
VITC POSI1	VITC POSITION-1 select	12 line : 16 line : 20 line	Selects a line the down-converter output into which the VITC signal is inserted. It can be inserted into any line in the range of 12th line to 20th line. Note The VITC signal can be inserted into the two positions by setting the sub-menu item "VITC POSITION-2 select".
VITC POSI2	VITC POSITION-2 select	12 line : 18 line : 20 line	Selects a line the down-converter output into which the VITC signal is inserted. It can be inserted into any line in the range of 12th line to 20th line. Note The VITC signal can be inserted into the two positions by setting the sub-menu item "VITC POSITION-1 select".

The items that are surrounded by square () in the Setup value column, show the default setting when shipped from the factory.

VIDEO (HD)

Display on LCD	Setup item	Setup value	Description
SDI OUT	SDI OUT	AUTO OFF ON	Turns on and off the serial digital output. AUTO : It is not output only when the MODE switch is in the [SAVE] position. OFF : It is not output. ON : It is output.
MSTR LEV	MASTER LEVEL preset : 100 % (4000 H)	0.0 % (0 H) : 100 % (4000 H) : 141.3 % (5A 70H)	Adjusts the signal level of the HD video signal that is output from the HD SDI OUT connector and the ANALOG HD COMPONENT connector, and also the signal level of the analog composite video signal that is output from the COMPOSITE connector. The Y, P _B and P _R signal levels are adjusted at the same time.
Y LEVEL	Y LEVEL preset : 100 % (4000 H)	0.0 % (0 H) : 100 % (4000 H) : 141.3 % (5A 70H)	Adjusts the signal level of the HD video signal that is output from the HD SDI OUT connector and the ANALOG HD COMPONENT connector, and also the signal level of the analog composite video signal that is output from the COMPOSITE connector. The Y signal level is adjusted.
PB LEVEL	P _B LEVEL preset : 100 % (4000 H)	0.0 % (0 H) : 100 % (4000 H) : 141.3 % (5A 70H)	Adjusts the signal level of the HD video signal that is output from the HD SDI OUT connector and the ANALOG HD COMPONENT connector, and also the signal level of the analog composite video signal that is output from the COMPOSITE connector. The P _B signal level is adjusted.
PR LEVEL	P _R LEVEL preset : 100 % (4000 H)	0.0 % (0 H) : 100 % (4000 H) : 141.3 % (5A 70H)	Adjusts the signal level of the HD video signal that is output from the HD SDI OUT connector and the ANALOG HD COMPONENT connector, and also the signal level of the analog composite video signal that is output from the COMPOSITE connector. The P _R signal level is adjusted.
SETUP LEV	SETUP LEVEL preset : 0	−10.0 : 7.5 : 10.0	Adjusts the black level of the HD SDI OUT connector, the ANALOG HD COMPONENT connector, and the COMPOSITE (NTSC) connector.
SYNC PHSE	SYNC PHASE (HD) preset : 0	−36 : 0 : 36	Adjusts the H sync phase of the HD video signal that is output from the HD SDI OUT connector and the ANALOG HD COMPONENT connector in accordance with the menu.
FINE	FINE (HD) preset : 0	0 : 1024	Finely adjusts the H sync phase of the HD video signal that is output from of the HD SDI OUT connector and the ANALOG HD COMPONENT connector in accordance with the menu.
ROUNDING	ROUNDING	SIMPLE ADAPTIVE	Selects whether or not to perform the A-ROUNDING™ ¹⁾ processing. SIMPLE : The A-ROUNDING™ ¹⁾ processing is not performed. Fraction of the 10-bit input signal is truncated to create a 8-bit signal. ADAPTIVE : The A-ROUNDING™ ¹⁾ processing is performed. The 10-bit input signal is rounded to the 8-bit signal.

The items that are surrounded by square () in the Setup value column, show the default setting when shipped from the factory.

- 1) A-ROUNDING™
A method to round off the 10-bit input signal to the 8-bit signal. Using this method, the step noise that can easily occur in the picture that includes the gentle slope.
A-ROUNDING is a trademark of Sony Corporation.

VIDEO (NTSC)

Display on LCD	Setup item	Setup value	Description
D. CONV OUT	DOWNCONVERTER OUT	AUTO OFF ON	Turns on and off the COMPOSITE connector output. AUTO : It is not output only when the MODE switch is in the [SAVE] position. OFF : It is not output. ON : It is output.
D. CONV MOD	DOWNCONVERTER MODE	EDGE-CROP LETTER BOX SQUEEZE	Selects the mode of the COMPOSITE connector output. EDGE-CROP : Selects the edge-crop mode. LETTER BOX : Selects the letter box mode. SQUEEZE : Selects the squeeze mode.
H CROP PS	H CROP POSITION preset :0	-120 : 0 : 120	Adjust the H crop (Horizontal direction of the segment that is extracted by the edge-crop mode).
SETUP NTS	SETUP LEVEL (NTSC) Preset : 0 IRE	0.0 : 7.5 : 10.0	Adjusts the setup level of the analog composite signal that is output to the COMPOSITE connector.
SYNC NTSC	SYNC PHASE (NTSC) preset :0	-128 : 0 : 127	Adjusts the sync phase of the analog composite signal that is output to the COMPOSITE connector.
FINE NTSC	FINE(NTSC) preset :0	0 : 1024	Finely adjusts the sync phase of the analog composite signal that is output to the COMPOSITE connector.

The items that are surrounded by square () in the Setup value column, show the default setting when shipped from the factory.

AUDIO

Display on LCD	Setup item	Setup value	Description
INPUT 1/2	INPUT 1/2	ANA ☐ DIGI	Selects whether or not to set the audio channels 1 and 2 into digital when the video input is set to the digital signal. ANA : Sets them to analog. DIGI : Sets them to digital.
INPUT 3/4	INPUT 3/4	ANA ☐ DIGI	Selects whether or not to set the audio channels 3 and 4 into digital when the video input is set to the digital signal. ANA : Sets them to analog. DIGI : Sets them to digital.
EMPHASIS	EMPHASIS	☐ OFF ON	Turns on or off the emphasis of the analog audio input. OFF : Turns off the emphasis. ON : Turns off the emphasis.
DOUBLE REC	DOUBLE REC	☐ OFF ON	Selects whether or not to record the audio channels 1 and 2 signals into audio channels 3 and 4 at the same time. OFF : Channels 1/2 and 3/4 are used separately. ON : The same signal as channels 1/2 is recorded into channels 3/4.
PB VOLUME	PB VOLUME	☐ UNITY VARIABLE	Selects whether or not to adjust the playback level of the audio output from the HD SDI OUT and AUDIO OUT connectors by the AUDIO PB LEVEL knob on the front panel. UNITY : The playback level cannot be adjusted by the AUDIO PB LEVEL knob. The audio signal is played back by the level as it is recorded. VARIABLE : The playback level is adjusted by the AUDIO PB LEVEL knob.

The items that are surrounded by square (☐) in the Setup value column, show the default setting when shipped from the factory.

SYSTEM

Display on LCD	Setup item	Sub item	Setup value	Description
V TEST SG	VIDEO TEST SG		☐ OFF CB (100 % Color Bar) RMP(Ramp) TEN(Ten Steps) GRY(Gray)	Selects a test signal that is going to be output from the VTR's internal signal generator. OFF : Test signal is not generated. VTR performs the ordinary operation. Other than OFF : The selected test signal is output to VTR. The test signal can also be recorded.
A TEST SG	AUDIO TEST SG		☐ OFF 1K/1 1K/2	Selects operation of the internal audio test signal generator. OFF : The audio test signal generator is not operated. 1K/1 : 1 kHz (In this case, the sine wave signal of 1 kHz at -18 dB FS is supplied to all audio inputs.) 1K/2 : 1 kHz (In this case, the sine wave signal of 1 kHz at -20 dB FS is supplied to all audio inputs.)
CAM POWER	CAMERA POWER SUPPLY		ON ☐ OFF	Sets whether or not to supply the power from VTR to the camera that is connected via 26-pin connector. ON : Power is supplied. OFF : Power is not supplied.
	DISPLAY SELECT			Sets whether or not to select a display by pressing the DISPLAY button of the display window operational buttons.
IN/OUT SIG		IN/OUT SIGNAL	☐ ON OFF	Sets whether or not to select the video input/output meter display using the DISPLAY button of display window operational buttons. ON : Selects the video input/output meter display by the DISPLAY button of display window operational buttons. OFF : Not selects the video input/output meter display by the DISPLAY button of display window operational buttons.
INFORMATI		INFORMATION	☐ ON OFF	Sets whether or not to select the information display using the DISPLAY button of display window operational buttons. ON : Selects the information display by the DISPLAY button of display window operational buttons. OFF : Not selects the information display by the DISPLAY button of display window operational buttons.
ERROR LOG		ERROR LOG	ON ☐ OFF	Sets whether or not to select the error log display using the DISPLAY button of display window operational buttons. ON : Selects the error log display by the DISPLAY button of display window operational buttons. OFF : Not selects the error log display by the DISPLAY button of display window operational buttons.
RF CHECK		RF CHECK	ON ☐ OFF	Sets whether or not to select the RF check display using the DISPLAY button of display window operational buttons. ON : Selects the RF check display by the DISPLAY button of display window operational buttons. OFF : Not selects the RF check display by the DISPLAY button of display window operational buttons.
CHANNEL		CHANNEL CONDITION	ON ☐ OFF	Sets whether or not to select the channel condition display using the DISPLAY button of display window operational buttons. ON : Selects the channel condition display by the DISPLAY button of display window operational buttons. OFF : Not selects the channel condition display by the DISPLAY button of display window operational buttons.

The items that are surrounded by square (☐) in the Setup value column, show the default setting when shipped from the factory.

Display on LCD	Setup item	Sub item	Setup value	Description
LOAD/SAVE				Reads out and saves the setup data of the bank.
LOAD		LOAD	0 1 2 3	Reads the setup data of the bank by selecting a number among 0 to 3 and by pressing the SET button. 0 : Default data when shipped from the factory 1 : Bank 1 data 2 : Bank 2 data 3 : Bank 3 data
SAVE		SAVE	1 2 3	Saves the setup data of the bank by selecting a number among 1 to 3 and by pressing the SET button. 1 : Bank 1 data 2 : Bank 2 data 3 : Bank 3 data
REMOTE				Performs setting regarding remote control.
REMOTE		REMOTE	9PIN ISR	Sets which interface the REMOTE connector is used for. 9-PIN : The REMOTE connector is used as the Sony 9-pin protocol interface. ISR : The REMOTE connector is used as the ISR interface.
BAUD		BAUD RATE	19200 : 19200 bps 9600 : 9600 bps 4800 : 4800 bps 2400 : 2400 bps 1200 : 1200 bps	Sets the communication speed (baud rate) in the ISR mode. 19200 : 19200 bps 9600 : 9600 bps 4800 : 4800 bps 2400 : 2400 bps 1200 : 1200 bps
CAM REMOT		CAMERA REMOTE	DIGI 700 AUTO	Selects a protocol that is used for communication with the camera which is connected to the CAMERA connector. DIGI : Communication is performed by the digital command. 700 : Communication is performed by the SONY Camera System-700 Control Protocol AUTO : Communication is performed by the usable protocol that is detected automatically when a camera is connected.
SYSTEM				Performs setting regarding system.
FREQUENCY		FREQUENCY	59.94 60	Selects a field frequency of the unit. 59.94 : Sets 59.94 Hz as the field frequency of the unit. 60 : Sets 60 Hz as the field frequency of the unit.
HD LINE		HD LINE	1035 1080	Selects the number of effective recording lines of a frame of the analog HD input. 1035 : Sets 1035 lines as the effective recording lines of a frame. 1080 : Sets 1080 lines as the effective recording lines of a frame.

The items that are surrounded by square () in the Setup value column, show the default setting when shipped from the factory.

TRACKING

Display on LCD	Setup item	Setup value	Description
AUTO TRCK	AUTO TRACKING	OFF ONE ON	Sets whether or not to perform auto tracking. OFF : Disables auto tracking. ONE : Auto tracking is performed only once when tape is inserted. ON : Enables the auto tracking all the time.

The items that are surrounded by square () in the Setup value column, show the default setting when shipped from the factory.

3-2. DIAG Menu

The unit has the DIAG menu that is used for adjustments and diagnostics.

This menu has the hierarchical structure. The PAGE sub-menu is characterized as it is surrounded by the triangle bracket < >.

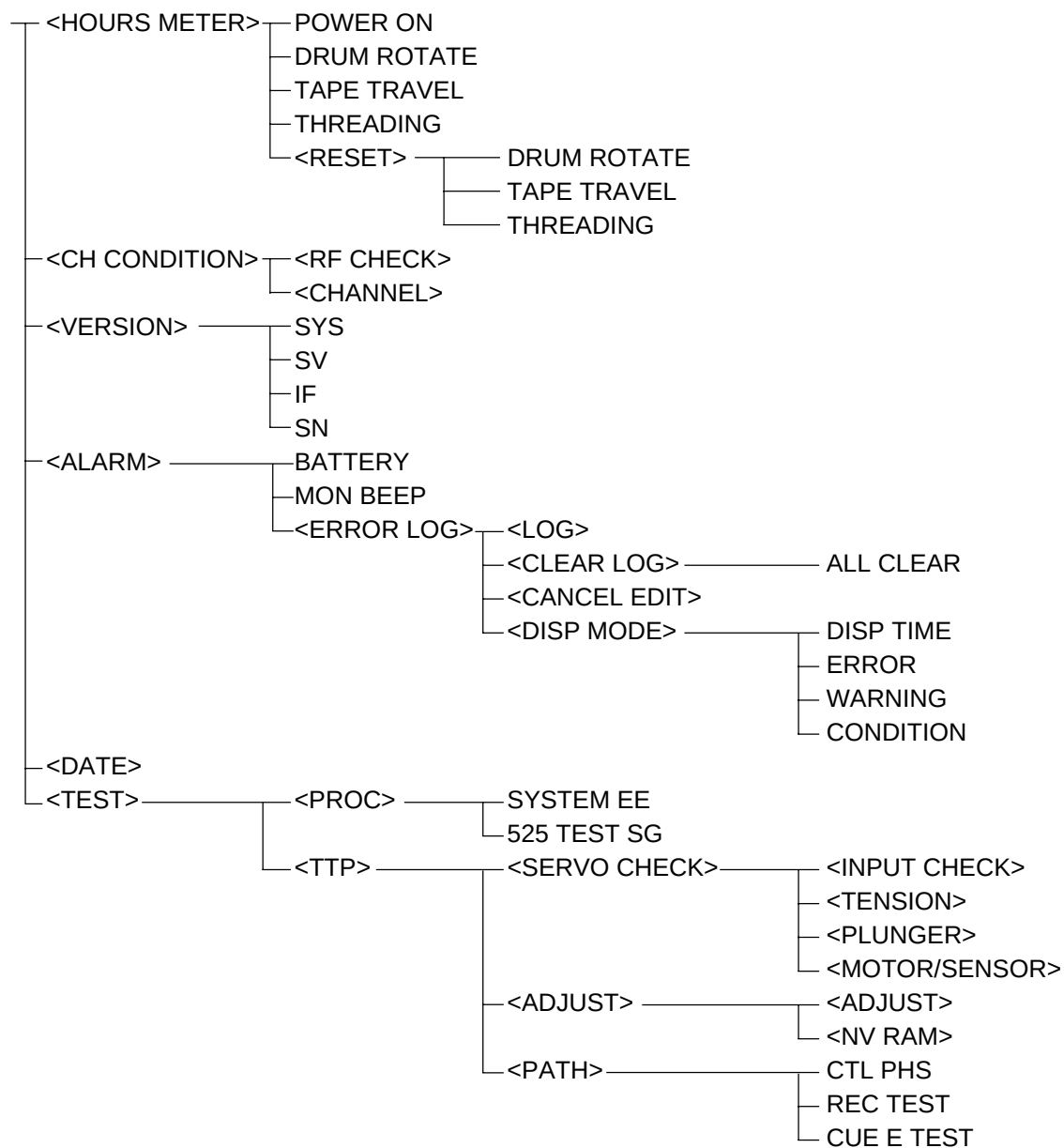
Operation procedure

1. Starting up the DIAG menu
Press the DIAG button to enter the DIAG menu.
2. Select a PAGE
Move the asterisk * (cursor) using the UP or DOWN button to select the desired PAGE.
When the desired PAGE is selected, press the SET button.
Repeat this procedure until the desired ITEM is found.
3. Selecting an ITEM
Move the asterisk * (cursor) using the UP or DOWN button to select the desired item.
When an item is selected, press the SET button.

The setup value blinks.
4. Setting the ITEM
Change the data of the selected setup item by pressing the UP or DOWN button.

Press the SET button to register and save the changed value.
To return to the original value before change, press the DISPLAY button.
5. Exiting the DIAG menu
Press the DIAG button to exit the DIAG menu.

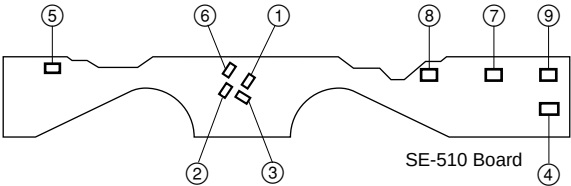
DIAG MENU



Audio Meter LCD	Description
HOURS METER 1	Displays the following contents.
POWER ON xxxxxxH	 Accumulated hours of power-on time.
DRUM ROTATE xxxxxxH [xxxxxx]	 Accumulated hours of drum rotation time. The value surrounded by bracket [] can be reset by user.
SET KEY NEXT	
HOURS METER2	
TAPE TRAVEL xxxxxxH [xxxxxx]	 Accumulated hours of tape run time (The hours that are converted to the equivalent tape length) The value surrounded by bracket [] can be reset by user.
THREADING xxxxxxH [xxxxxx]	 Number of times of threading The value surrounded by bracket [] can be reset by user.
<RESET> SET KEY NEXT	
RESET	Resetting the meters that can be reset by user.
R DRUM ROTATE xxxxxxH	 Resets the drum rotation time.
R TAPE TRAVEL xxxxxxH	 Resets the tape run time.
R THREADING xxxxxxT	 Resets the number of times of threading.
EXIT	
CH CONDITION	
<RF CHECK>	 Indication on the A/V meter
<CHANNEL>	 Indication on the channel condition meter
EXIT	
VERSION	Displaying the software version
SYS VER	 System control IC (IC110/SST-13)
SV VER	 Servo IC (IC615/SST-13)
IF VER	 Camera interface IC (IC509/SST-13)
SN-xxxxxx (xx)	 Serial No. and destination
SET KEY-EXIT	
ALARM	Setting the warnings and related items
BATTERY xx.xV	 Threshold voltage to issue the BATTERY NEAR END warning
MON BEEP ON	 Warning sound to the monitor system ON : Warning sound is issued. OFF : Warning sound is not issued.
<ERROR LOG>	 Setting related to error log
ERROR LOG	Setting related to error log
<LOG>	 Indicates the logs (Error/Warning/Condition)
<CLEAR LOG>	 Deletes all logs
<CANCEL EDIT>	 Sets the items that do not issue log and warning indication
<DISP MODE>	 Changes the log indication (TC/real time/Error/Warning/Condition)
EXIT	
TIME CODE LOG	1 Time data mode to indicate the logs and number of logs (One log in the example shown)
	Note When the DISP TIME setting is REAL, the REAL TIME LOG indication is automatically selected.
1. XX:XX:XX:XX	 Log number and its issuing time
w LOST LOCK	 Contents of the log that is issued. e : Error w : Warning c : Condition
	Note As many as 99 logs can be saved. When log exceeds 99, the oldest log (log No. 1) is deleted. The larger the log number, the newer the log is.

Audio Meter	LCD	Description
CANCEL EDIT	3	 Sets the items that do not issue the log and warning indication. The numeral indicates where the item with the cursor is located.
* LOST LOCK		The items to which the asterisk (*) is given by pressing the SET button, do not issue log or warning display.
NO EXT REF V		
* RF TROUBLE		
BATTERY NEAR		
BATTERY END		
TAPE NEAR		
CANCEL TOTAL :02		Total number of items that are set to be canceled.
DISP MODE		Setting the log indication mode
DISP TIME	TC	 Time data of log indication TC : time code REAL : Real time
ERROR	ON	 Error indication by log ON : Error is displayed. OFF : Error is not displayed.
WARNING	ON	 Warning indication by log ON : Displayed. OFF : Not displayed.
CONDITION	ON	 Condition indication by log ON : Displayed. OFF : Not displayed.
		Example : When you want to check only the error items of the logs, set ON to the ERROR only and observe the logs.
DATE		
'XX/XX/XX		 Setting year, month and day.
SET : SET		
DISPLAY : CANCEL		Hours are set by the front time code setting block.
TEST		Test menu
<PROC>		 Tests the processor
<TTP>		 Adjusts the TTP system
PROC		
SYSTEM EE	OFF	 Selects the bypass mode of digital signal (for check). (Refer to the Overall Block Diagram in the Section 4.) OFF : Normal operating mode SYS1 : SYSTEM EE 1 mode SYS2 : SYSTEM EE 2 mode SYS3 : SYSTEM EE 3 mode SYS4 : SYSTEM EE 4 mode
525 TEST SG	OFF	 Internal test signal for down converter output OFF : Not output CB : 100 % Color Bar (DCP) RMP : Ramp TEN : Ten Step (DCP) MLT : MULTI BURST (DCP) PBR : PULSE & BAR (DCP)
EXIT		

Audio Meter LCD	Description
INPUT CHECK 753216 11111111 11110000 4891211	Checking the sensors a) SE-510 board 0 : Sensor is working 1 : Sensor is not working 1...Format detection sensor 1 2...Format detection sensor 2 3...Format detection sensor 3 4...L cassette record inhibit sensor 5...S cassette record inhibit sensor 6...Cleaning tape identification sensor 7...L cassette sensor 8...Spare 9...Spare b) Cassette compartment 0 : Sensor is working 1 : Sensor is not working c) Tape top/tape end sensor 0 : Sensor is working 1 : Sensor is not working 11...Tape end sensor 12...Tape end sensor
TENSION xxxx	Indicating the tension force in hexadecimal notation. S tension sensor
PLUNGER PINCH S BRAKE T BRAKE C ROLLER EXIT	Checking the pinch roller F. FWD button is pressed : Operates. (Effective when the thread sensor is ON) STOP button is pressed : Returns to the original state. Checking the S reel brake F. FWD button is pressed : Operates. STOP button is pressed : Returns to the original state. Checking the T reel brake F. FWD button is pressed : Operates. STOP button is pressed : Returns to the original state. Checking the cleaning roller F. FWD button is pressed : Operates and returns to the original state immediately.
CASS-COMP LOAD : 0 UNLOAD : 1	Checking the cassette compartment and the cassette up/down sensors. F. FWD button is pressed : Cassette compartment moves down. (Effective only when the cassette-in sensor is ON) REW button is pressed : Cassette compartment moves up. Cassette-down sensor 1 : Sensor is working 0 : Sensor is not working Cassette-up sensor 1 : Sensor is working 0 : Sensor is not working



Audio Meter LCD	Description
THREAD	Checking the threading operation and the threading sensor. F. FWD button is pressed : Threading is executed. REW button is pressed : Unthreading is executed.
THREAD : 0	 Thread sensor 1 : Sensor is working 0 : Sensor is not working
UNTHREAD : 1	 Unthread sensor 1 : Sensor is working 0 : Sensor is not working
S REEL	Checking the S reel motor. F. FWD button is pressed : Rotates in the clockwise direction. (Hexadecimal number increases.) REW button is pressed : Rotates in the counterclockwise direction. (Hexadecimal number decreases.) STOP button is pressed : Stops.
xxxx	(Hexadecimal data)
T REEL	Checking the T reel motor. F. FWD button is pressed : Rotates in the clockwise direction. (Hexadecimal number increases.) REW button is pressed : Rotates in the counterclockwise direction. (Hexadecimal number decreases.) STOP button is pressed : Stops.
xxxx	(Hexadecimal data)
CAPSTAN	Checking the capstan motor. F. FWD button is pressed : Rotates in the clockwise direction. (Hexadecimal number increases.) REW button is pressed : Rotates in the counterclockwise direction. (Hexadecimal number decreases.) STOP button is pressed : Stops.
xxxx	(Hexadecimal data)
DRUM	Checking the drum motor. F. FWD button is pressed : Drum rotates. (Checking starts.) STOP button is pressed : Drum stops.
SPEED : 1	0 : NG
PHASE : 1	1 : OK
PG : 1	
ADJUST	For the servo system adjustment (Refer to Section "5-3. Servo System Adjustment" of Maintenance Manual Part 2 Vol. 1.)
TRACON VR	 Correction of the clicking position of the TRACKING control VR
CAP FG DUTY	 Capstan FG duty adjustment
CAP SPEED	 Capstan free speed adjustment
DRUM PG	 Drum PG phase adjustment
EXIT	
MVRAM CONTROL	Saving the servo system adjustment data (Refer to Section "5-3. Servo System Adjustment" of Maintenance Manual Part 2 Vol. 1.)
NVRAM INITIAL	 Initialization of adjustment data
SV DATA SAVE	 Registration (saving) the servo data
EXIT	

Audio Meter LCD	Description
PATH	
CTL	PB Sets the servo lock phase during playback PB : Normal condition REC : Phase-locks in the same phase as recording.
REC TEST	OFF Sets the test signal OFF : Normal condition 1A : Ach 23.5 MHz B to Hch No signal 1AH : A to Hch 23.5 MHz 2AG : A, C, E, Gch 11.7 MHz B, D, F, Hch No signal 2AH : A to Hch 11.7 MHz 3A : Ach 2.9 MHz B to Hch No signal 3AE : A, Ech 2.9 MHz B to D, F to Hch No signal
CUE E TEST	Tests the CUE ERASE OFF : Normal operating mode ON : Test mode
EXIT	

3-3. ISR

The HDW-250 has an ISR (Interactive Status Reporting) function. The status of the HDW-250 or the details of errors can be monitored and managed on the screen of a personal computer, and the data displayed on the screen can be saved as a file or printed.

The functions corresponding to the HDW-250 are as follows. For more details, refer to the ISR (Interactive Status Reporting) Protocol Manual.

○ : Compatible

× : Not compatible

Common Command/Response

Response	Compatible
*RST;	○
*IDN?;	○
*TST #####;	○ SOFT RESET only
*TST?;	○ SOFT RESET only
*FLAGS?;	×
*STATUS?;	○
*CMDERR?;	○
*MSG? #####;	○

Response	Compatible
*ATN:OPC;	○
*ATN:CMDERR;	○
*ATN:QRESP;	○

Common Command <Option>

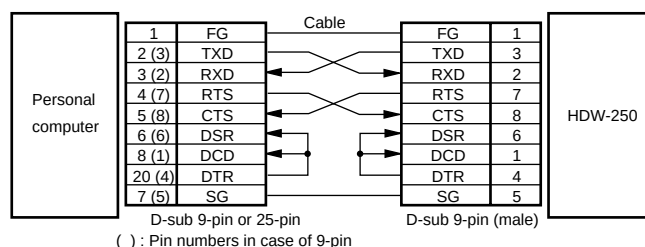
Command	Compatible
*UPLOAD?:TYPE;	○
*PIPE:TYPE;	○ M9PIN, MLABEL
*ADDSEL ADDSUB, SW;	×
*ATN;	×
*ATN:PIPE:TYPE;	○ M9PIN, MLABEL

Sony Private Command

Command	Compatible
SETUP?;	○
SETUP? #####;	○
SETUP #####;	○
HRS?;	○
HELP:TST?;	○
RDLOG?:TYPE:D;	○
CLRLOG:TYPE;	○
HELP:LOG?;	○
DEVID;device-id	○
LDSW:TYPE;data	×
CHCOND?	○
CHCOND/ALRDY?;	○
RMCTL:TYPE;	○
DOWNLOAD;	○

Example of Connection

For more details, refer to the ISR (Interactive Status Reporting) Protocol Manual and BZI-500/501 User's Guide.



Section 4

Block Diagram and Circuit Description

Outline

The unit records and plays back the video signal and audio signal on a magnetic tape with the HD CAM format. Acoustic noise is reduced by decreasing the number of drum rotation to 1/2 of the studio VTR and by increasing the number of recording heads 2 times (8 heads).

Record System

The video signal input and the audio signal input are either one of the followings:

Video input signal

- Analog component input signal (Y/PB/PR)/CAMERA 26P
- HD SDI (SMPTE-292M/BTA S-004B;Serial Digital)/
BNC

Audio input signal

- Analog audio (LINE, Camera MIC)/
XLR-3P, CAMERA 26P
- HD SDI (SMPTE-292M/BTA S-004B;Serial Digital)/
BNC

The analog video signal that is input to the CC-82 board, is buffered and sent to the VPR-53 board. Either the analog video input signal or the HD SDI input signal after it is converted to A/D, is selected in accordance with the operating mode being used.

The selected signal is bandwidth compressed from 4:2:2 → 3:1:1 by the FIL IC. The signal receives the bit rate reduction by the HENC so that that input video signal is compressed to about 1/7. The outer and inner ECC are added to the compressed video signal by the ECC IC to generate the HD CAM format video signal. Four channels of the HD CAM format video signal are sent to the EQ-76 board.

On the other hand, the analog audio input signal is A/D converted by the ADA-44 board and sent to the audio processor of the DPR-53 board.

The outer ECC is added to the audio data output from the audio processor, by the ECC IC so that the audio signal conforming to the HD CAM format in which the audio signal is inner-coded inside the video compressed data, is generated. The audio signal of the HD CAM format is sent to the EQ-76 board.

During the cue channel recording, the analog audio signals of channel 1 to channel 4 are mixed to form the cue signal.

Playback System

The playback RF signal that is supplied from the head drum, is converted to the four-channel serial PB data by the PB equalizer and the Viterbi decoder of the EQ-76 board. The four channel serial PB data is input to the DE IC as they are, where the data receives the inner correction first then receives the outer correction of both video and audio signals. After corrections, the video signal is sent to the HDEC IC while the audio signal is sent to the AP5 IC. The video data is restored by the HDEC IC where the bit rate reduced video signal is restored to the video signal of the original bit rate. The video signal after restoration has the bandwidth of 3:1:1 that is input to the subsequent CNC IC. In the CNC IC, the un-correctable signal in units of correction block receives the error concealment.

The video signal is sent to the subsequent FIL IC where data is converted from 3:1:1 → 4:1:1. Output signal from the converter is sent to the analog component system and to the down converter output system where video and audio signals are output after respective signal processing. The audio output signal from the DE IC, is sent to AP5 where the signal receives the required audio processing and rate conversion. The audio signal is then D/A converted so that the analog audio signal is sent to the analog LINE OUT system and to the output system in which the audio signal is embedded to the HD SDI output. The video and audio signals are output from the respective signal systems.

System Control and Servo Systems

The system control receives the commands from the front panel, camera and external equipment as they are operated, and controls the entire system of the unit and controls its operations.

The unit has the three built-in CPUs for the system control, servo control and camera respectively. Data transfer between the three CPUs is accomplished by the dual port RAM.

The system control CPU is the 32-bit CPU operating on the 27 MHz clock. The servo CPU is the 16-bit CPU operating on the 20 MHz clock. Peripheral circuits of these CPUs are built inside the CPUs so that external circuit is minimized.

The system control CPU controls the time code reader and generator, character generator, front panel key control, LCD display and signal processing system. It also performs communication with camera and other external equipment.

The servo control CPU receives the command from the system control CPU, detects the sensor status, and the FG/PG status so that it can control the drum and motors.

The unit can be controlled from external equipment through the Sony 9-pin protocol or ISR.

Power Supply System

DC 12 V is supplied from a battery or through the DC IN connector. DC 12 V passes through the power supply selector circuit in the FU-76 board and is input to the DC/DC converter (PSW-67/68/69/70) board.

DC 12 V is up- and down-converted to the various DC voltages by the DC/DC converter so that the various DC voltages are supplied to the respective circuits inside the unit and to the external camera and others.

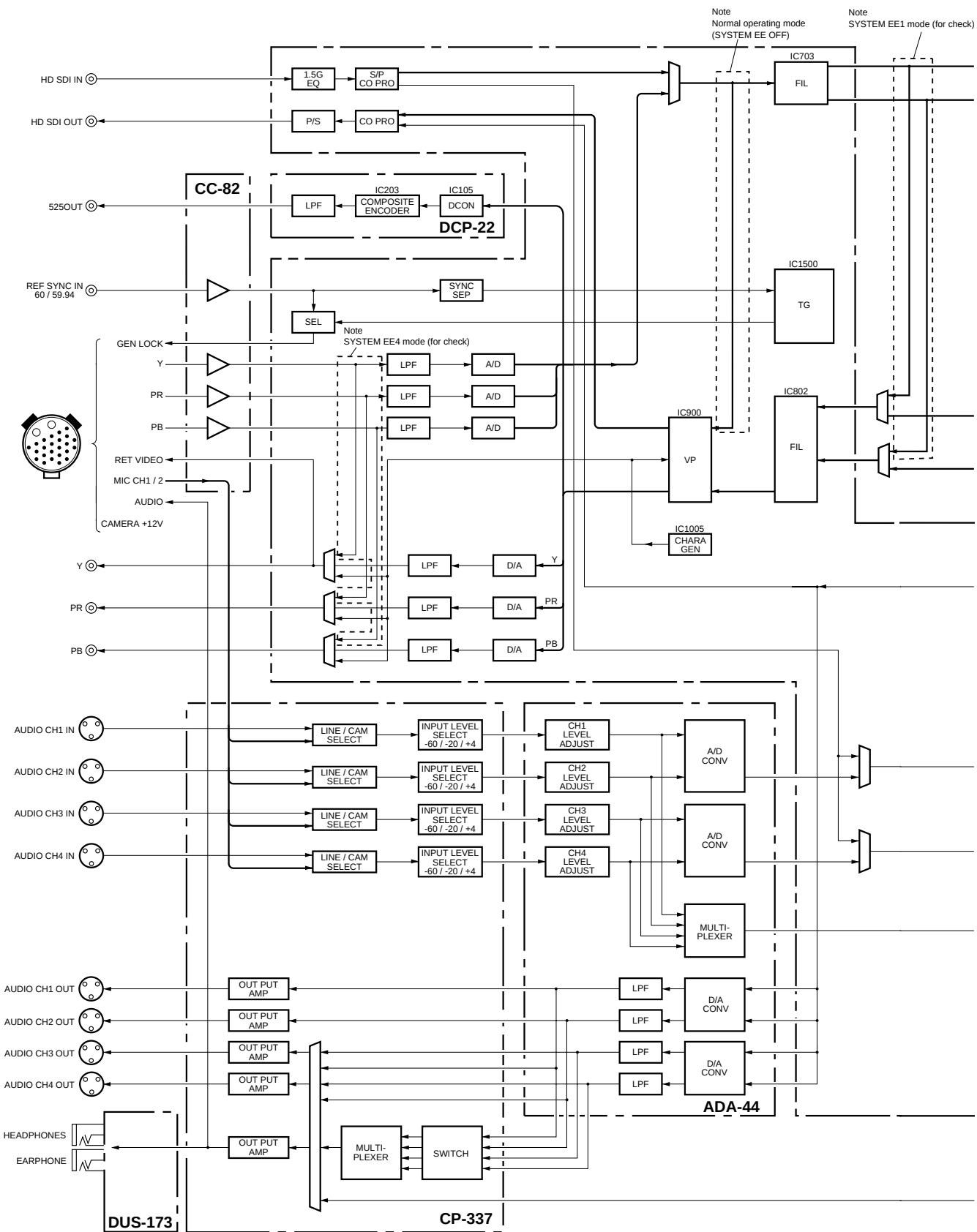
Features of the DC/DC converter are shown below.

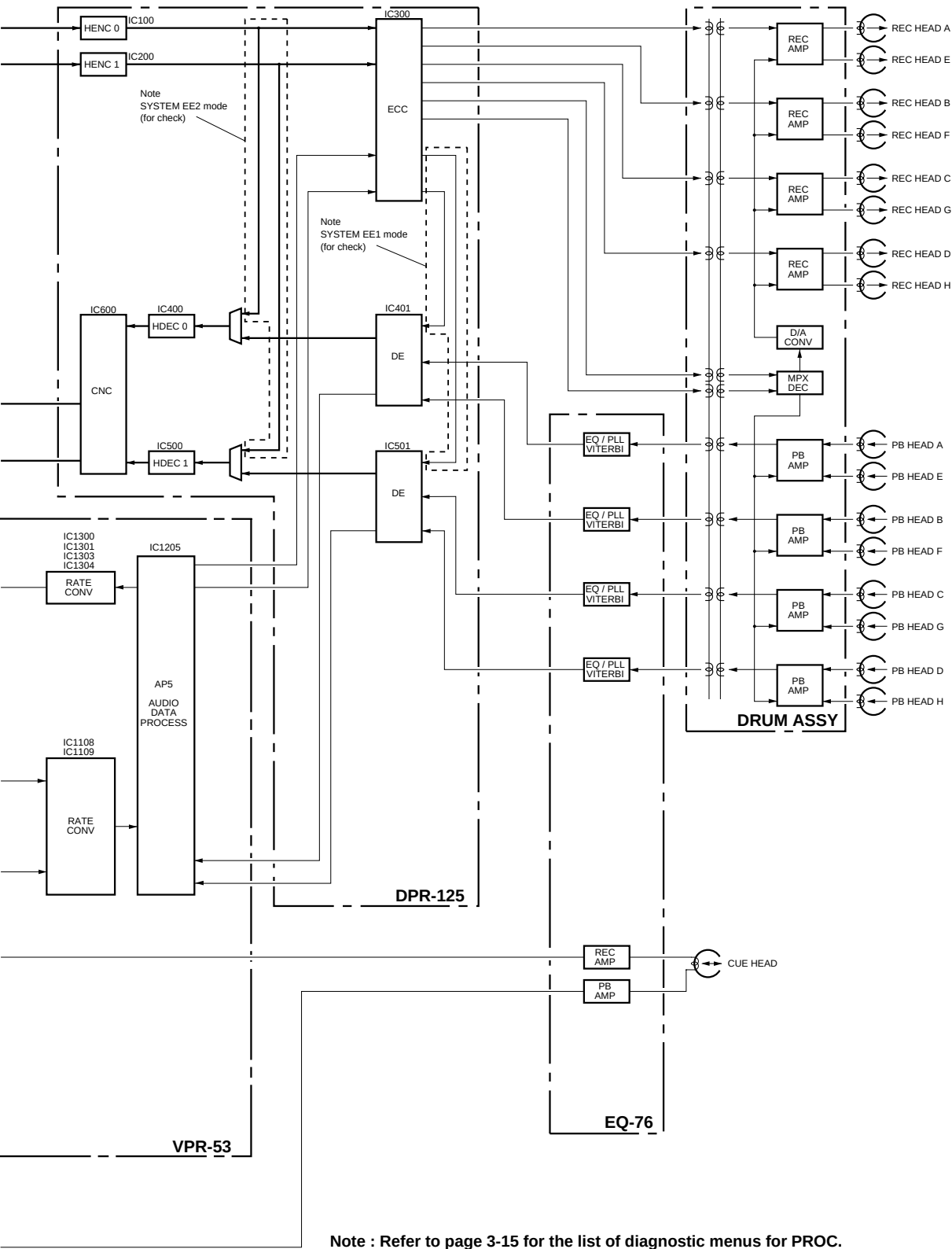
- The PWM switching regulator that has the high efficiency is used as the converter.
- When the output connectors are shorted by mistake, all outputs are shut down.
- When the input DC voltage goes outside the range of operation-guaranteed voltage range, the output is shut down.
- DC power is supplied to a part of the SST-13 board and that of the CP-337 board even when the POWER switch is turned off. This enables to display the remaining amount of battery or alarm indication even when the POWER switch is turned off.

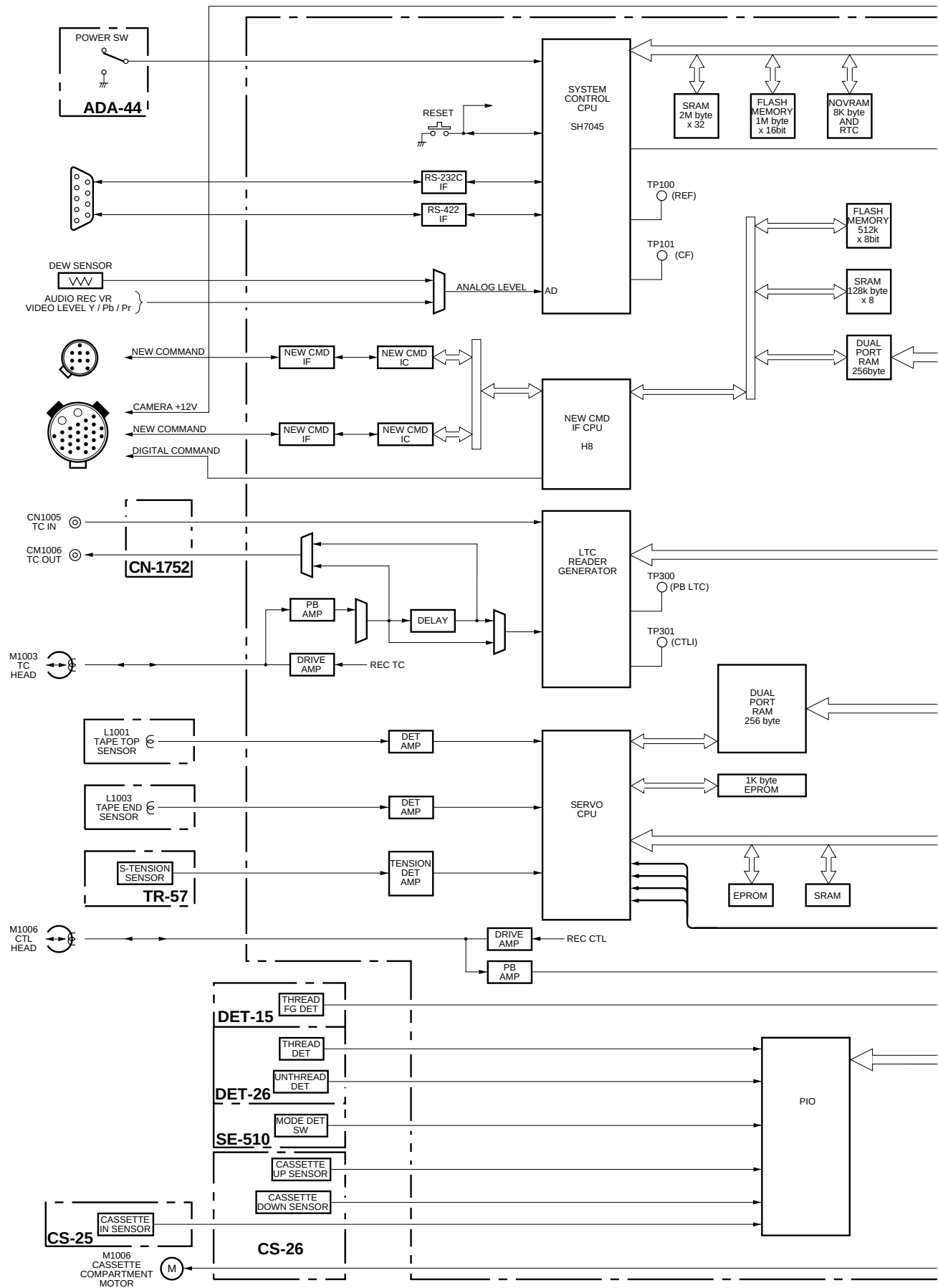


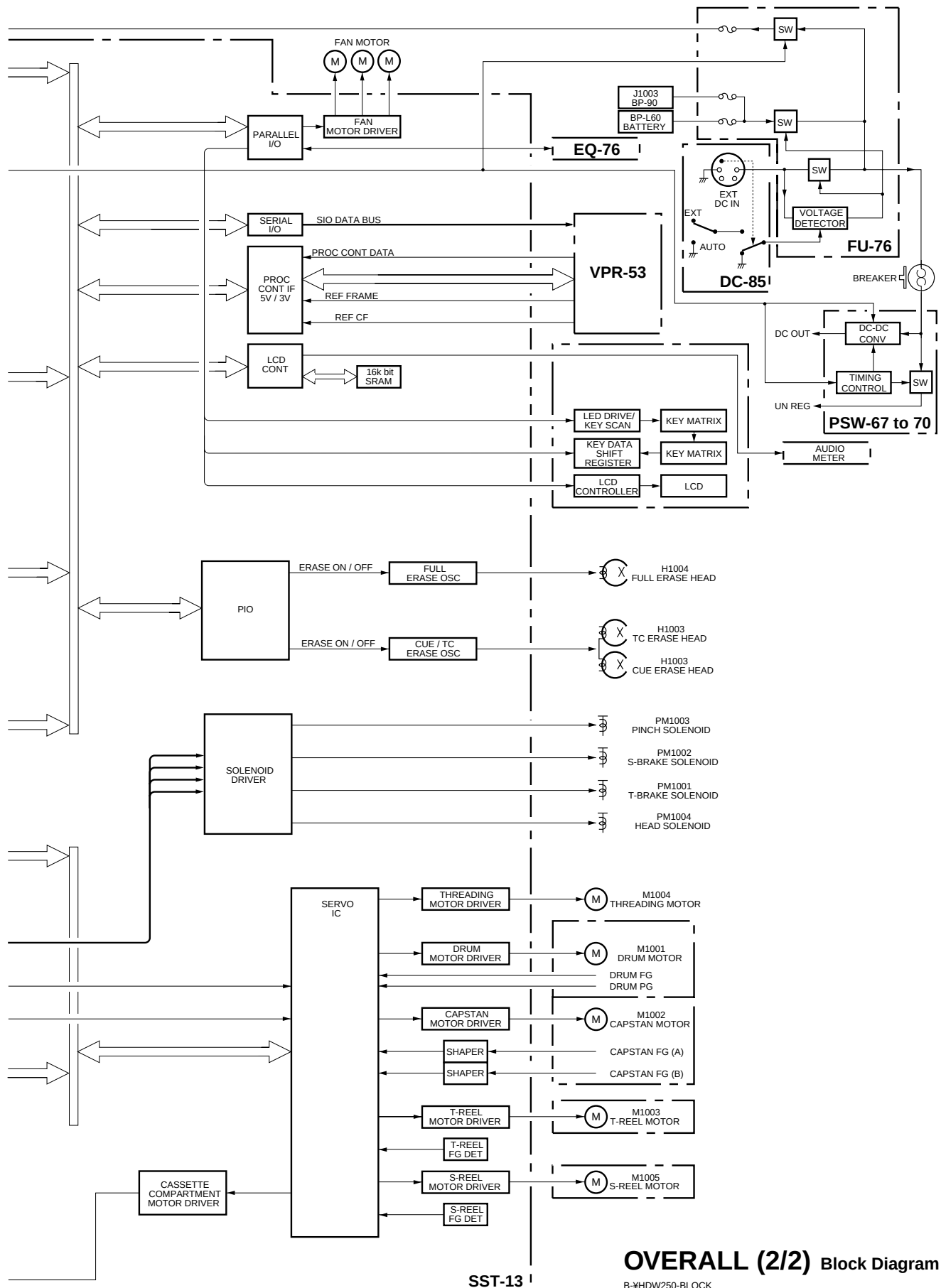
The SST-13 board has the built-in lithium battery that is used to save the RAM data and drive the time code reader and generator.

Block Diagram OVERALL (1/2)









Section 5

Periodic Maintenance and Inspection

5-1. Maintenance after Using the Unit under Special Environment

Check the following items after the unit has been used near the seacoast or in a dusty area.

1. Carefully clean off sand or dust from the unit.
2. Clean the video heads, upper and lower drums, and stationary heads.
3. Clean the tape running surfaces (tape guides, capstan shaft, pinch roller, etc.).
4. Clean the connector pins of the connector panel.
5. Check that the unit operates normally (recording or playback, etc.) and does not produce noise or malfunction.

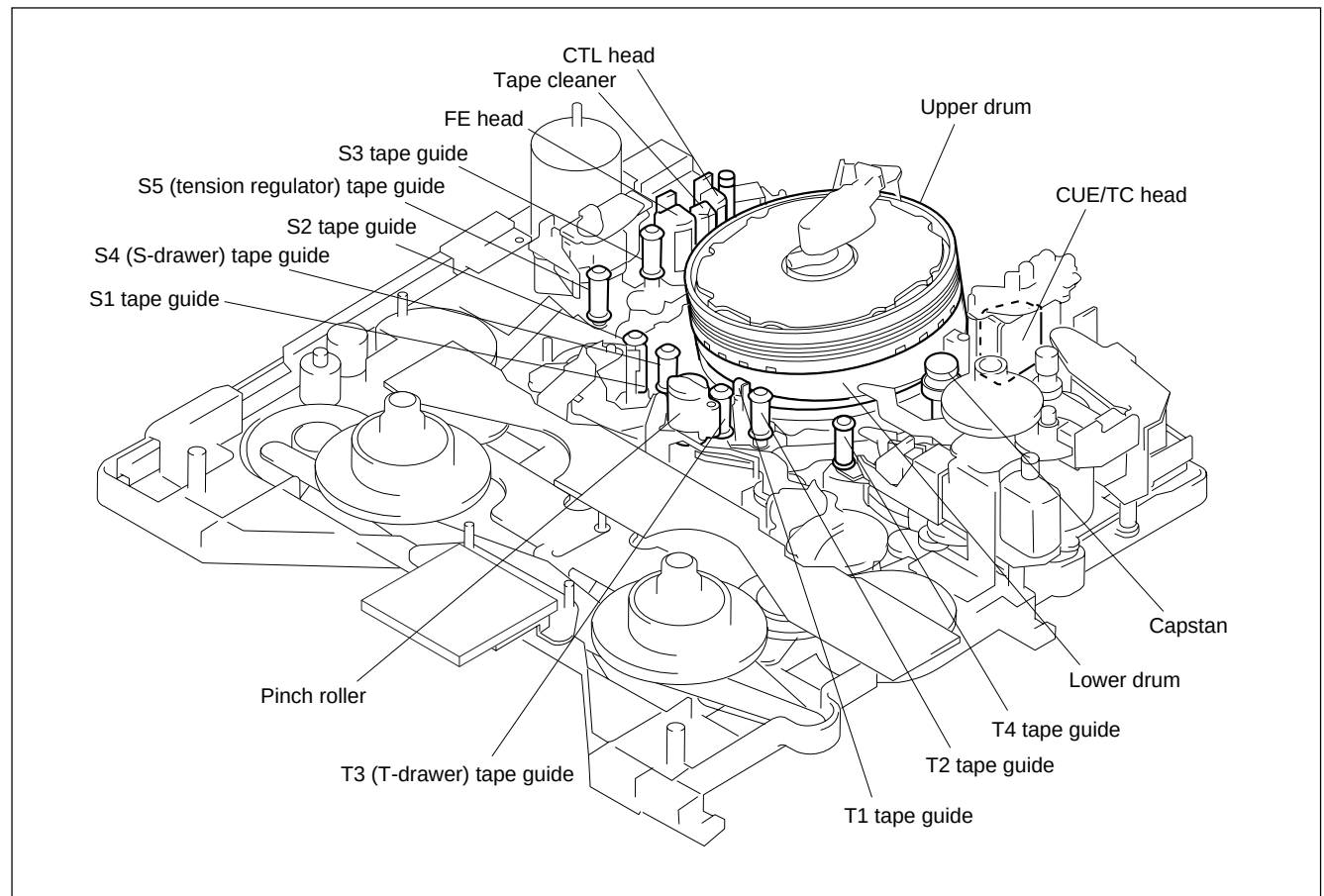
If the unit has a trouble, contact your local Sony Sales Office/Service Center.

5-2. Cleaning

To keep the unit functioning optimally and to prolong the life of the unit and tape, perform maintenance regularly.

Index

This section describes how to clean the parts that are shown in the figure below.



5-2-1. General Information for Cleaning Using a Cleaning Cloth

1. Precautions

- Before cleaning, be sure to turn off the main power.
- The blocks in the mechanical deck contain precision parts that have been adjusted precisely. Be careful not to damage the parts and do not apply excessive force during cleaning.
- Be careful not to touch the greased portions during cleaning. If grease gets on the cleaning cloth, replace the cloth.
If a greasy cleaning cloth is used, grease may be transferred to the wrong parts.
- Do not insert a cassette tape before the cleaning fluid has evaporated completely.

2. Preparation for Cleaning

- (1) Turn off the main power.
- (2) Remove the top panel. (Refer to Section 1-5.)

5-2-2. Cleaning Procedure Using Cleaning Cassette Tape

When the video head becomes dirty, clean it as follows.

Be sure to use the specified cleaning cassette tape. If a cleaning cassette tape other than the specified one is used, the video heads may become worn or damaged.

Specified cleaning cassette tape : BCT-HD12CL

Cleaning procedure

1. Insert the cleaning cassette tape BCT-HD12CL into the opening for cassette tapes.
2. The cassette tape is automatically played back for about three seconds and then ejected.

Notes

- If the cleaning cassette tape is not ejected after it has played back for more than three seconds, press the EJECT button immediately to eject the tape.
 - Do not fast forward or rewind the cleaning cassette tape and do not leave the cleaning cassette tape in the unit in the stopped state.
3. Check to see that the heads are not dirty.

If the heads are still dirty even after using the cleaning cassette tape, clean using a cleaning cloth.
(Refer to Section 5-2-3.)

5-2-3. Cleaning the Tape Running Surface of the Upper Drum and Video Heads

Note

The video heads and upper drum are damaged easily. Be careful not to damage them during cleaning.

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Note

Never use a swab for cleaning.

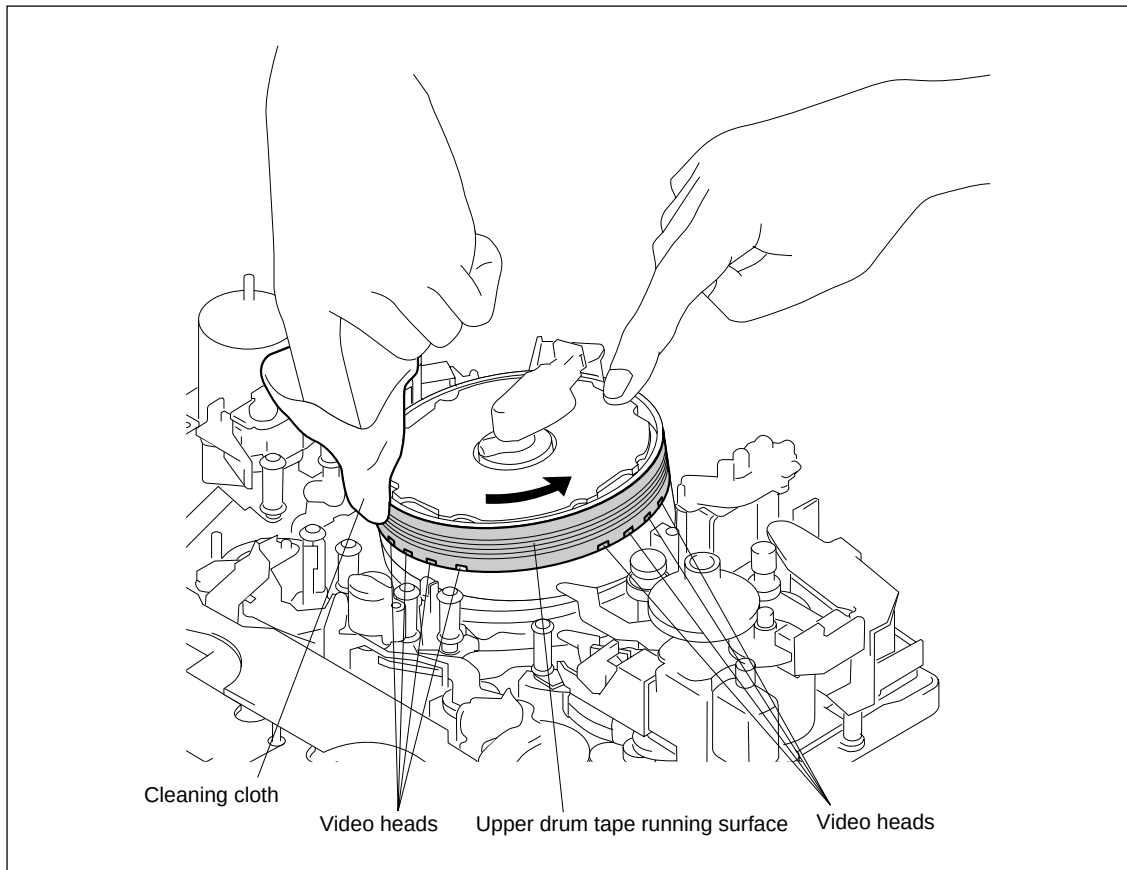
Procedure

1. Touch the cleaning cloth moistened with cleaning fluid onto the video heads lightly, and rotate the upper drum counterclockwise to clean.
2. Touch the cleaning cloth moistened with cleaning fluid onto the tape running surface (shaded portion) of the upper drum lightly, and clean the tape running surface in the circumferential direction.

Note

Be sure to rotate the upper drum counterclockwise. In addition, clean the tape running surface in the circumferential direction. If the upper drum is cleaned in the vertical direction, it may damage the video heads.

3. After cleaning, wipe the rotary heads using a dry cleaning cloth.



5-2-4. Cleaning the Tape Running Surface of the Lower Drum and Lead Surface

Note

Be careful not to damage the lower drum (especially the lead surface) during cleaning.
In addition, take care when cleaning the edge in the upper side of the lower drum because it is near the video heads.

Tools

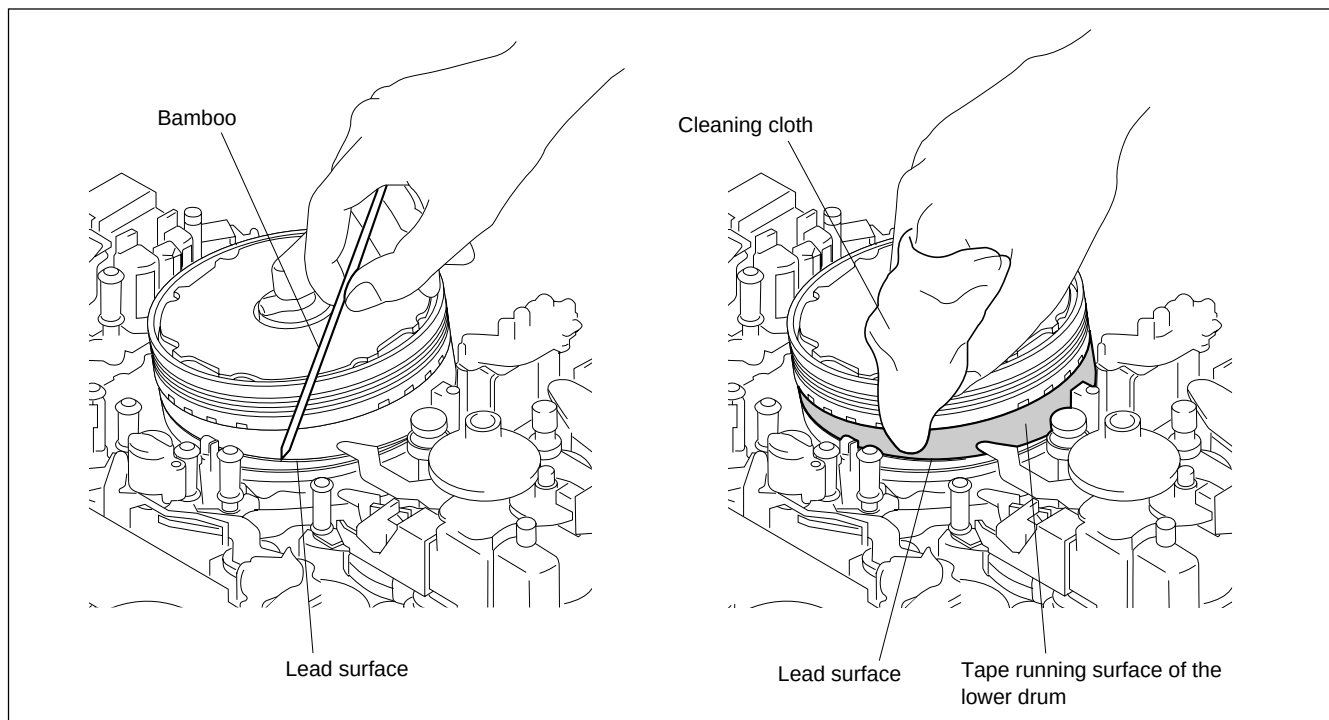
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Bamboo stick or equivalent (Never use a metallic skewer.)

Procedure

1. Run a bamboo stick (or equivalent) along the drum lead surface to remove magnetic powder and other materials as shown below.

Notes

- (a) Do not use a metallic skewer instead of a bamboo stock, as doing so will damage the tape running surface.
 - (b) If magnetic powder is attached to the drum head surface, it may adversely influence the tracking. Remove any magnetic powder completely.
2. Gently clean the tape running surface of the lower drum and the lead surface (shaded portion) using the cleaning cloth moistened with cleaning fluid.
 3. After cleaning, wipe the tape running surface of the lower drum and the lead surface using a dry cleaning cloth.



5-2-5. Cleaning the Stationary Heads

Note

Be careful not to damage the surfaces of the heads during cleaning.

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

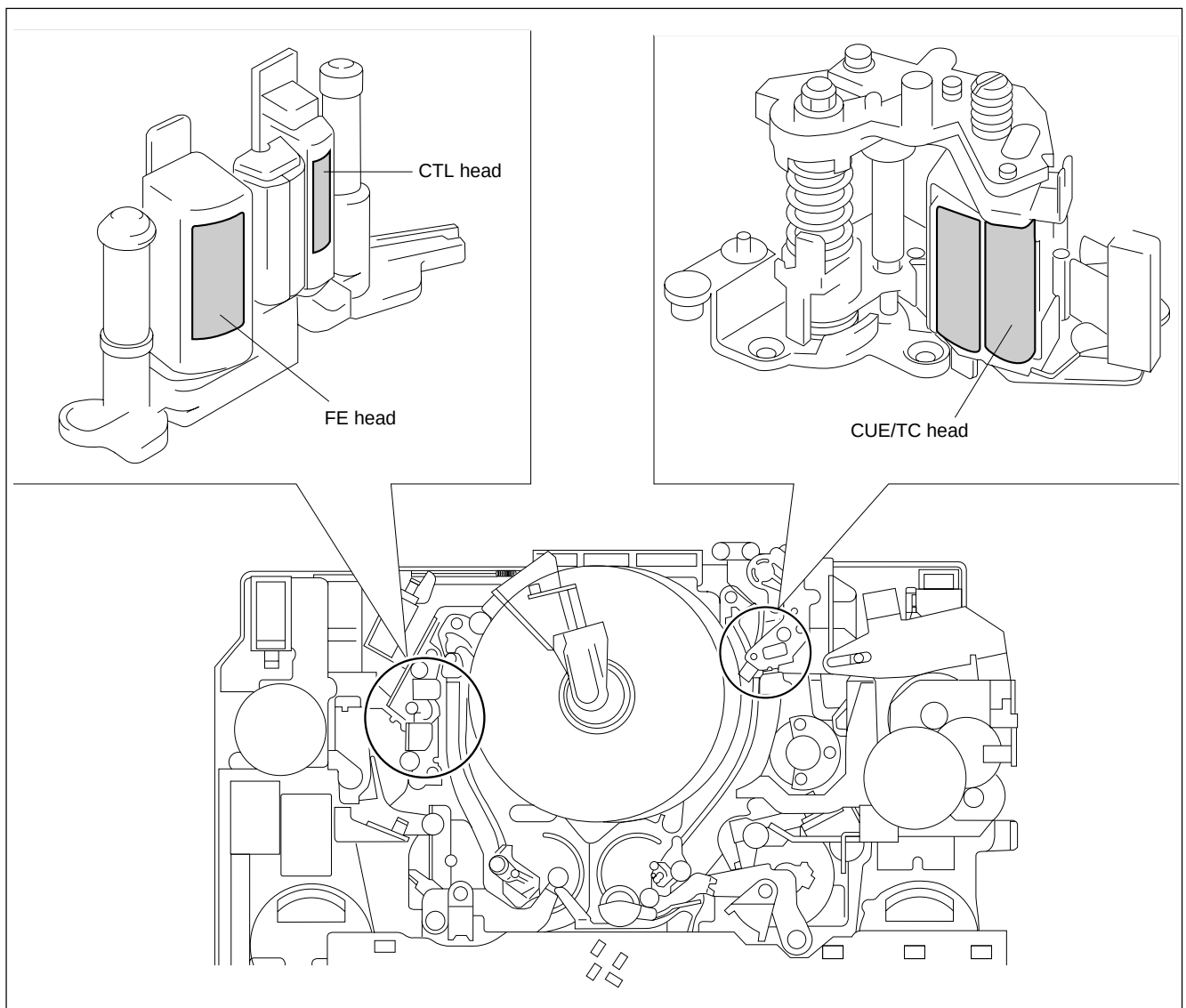
Procedure

1. Clean the tape running surfaces of the FE head, CTL head and CUE/TC head in the vertical direction using the cleaning cloth moistened with cleaning fluid.

Note

If magnetic powder or other materials are attached to the head gaps of the FE head, CTL head and CUE/TC head, an error may occur during recording or playback. Remove any magnetic powder completely.

2. After cleaning, wipe the stationary heads using a dry cleaning cloth.



5-2-6. Cleaning the Tape Running System and Tape Cleaner

Note

The sharp edge of the tape cleaner may cut your hand. Never touch the tape cleaner with bare hands, and take care when cleaning.

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Procedure

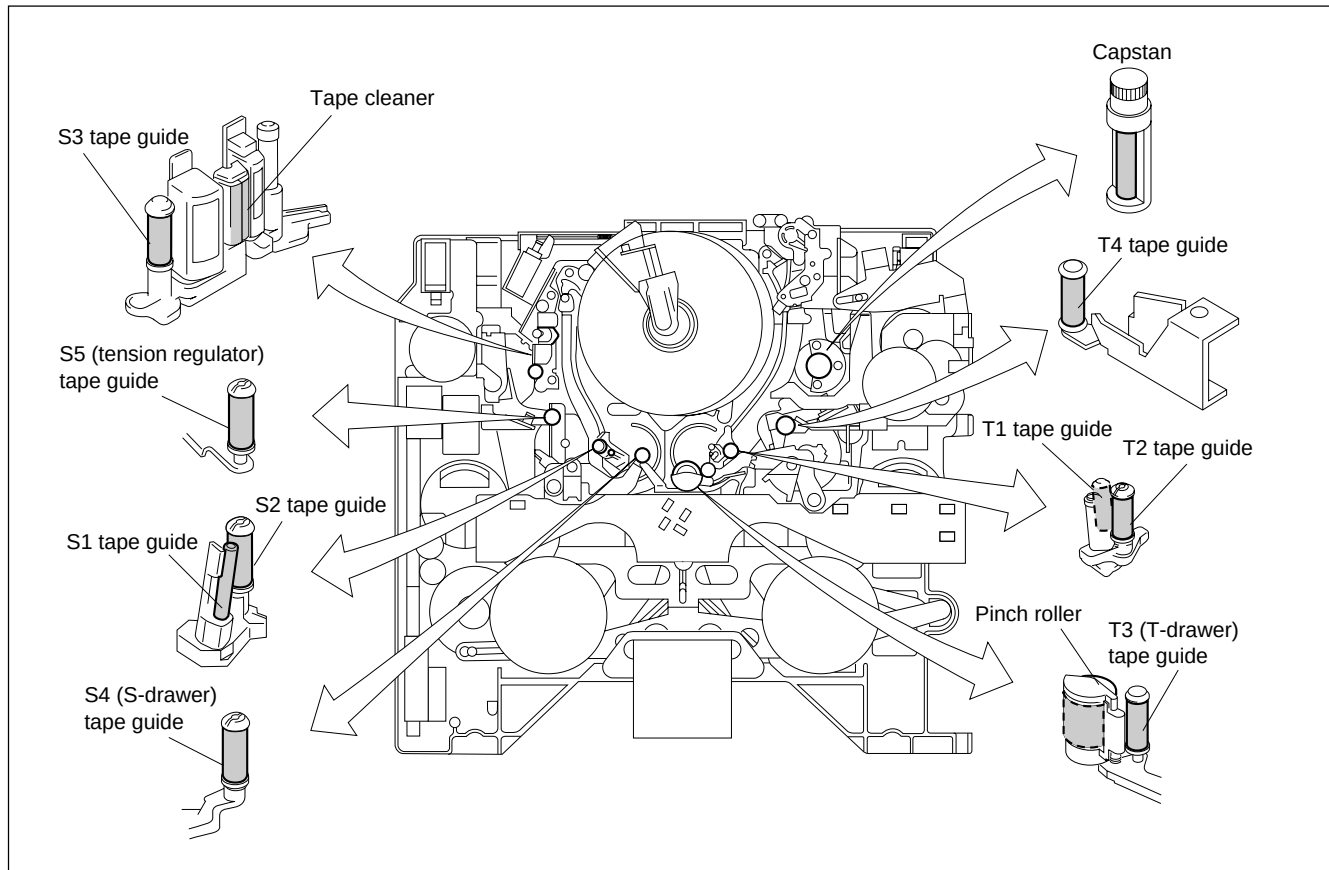
1. Clean the tape running surface (shaded portion) of each guide described below and the edge of the tape cleaner using the cleaning cloth moistened with cleaning fluid.

S1 to S4 guides, S5 (tension regulator) guide, T1 to T4 guides, capstan, pinch roller

CAUTION

Never touch the tape cleaner with bare hands, as the sharp edge of the tape cleaner may cut your hand.

2. Remove magnetic powder and other materials between the gap of the tape cleaner using paper.
3. After cleaning, wipe the tape running system and tape cleaner using a dry cleaning cloth.



5-2-7. Cleaning the Fan Motor

Periodically clean the fan motor in the left panel and the air inlets of the bottom panel and fan motors. If dust prevents air from flowing, the temperature inside the unit will rise and a trouble may occur.

Tools

- Swab
- Cleaning fluid : 9-919-573-01
- Vacuum cleaner

Air Inlets of Bottom Panel and Fan Motor

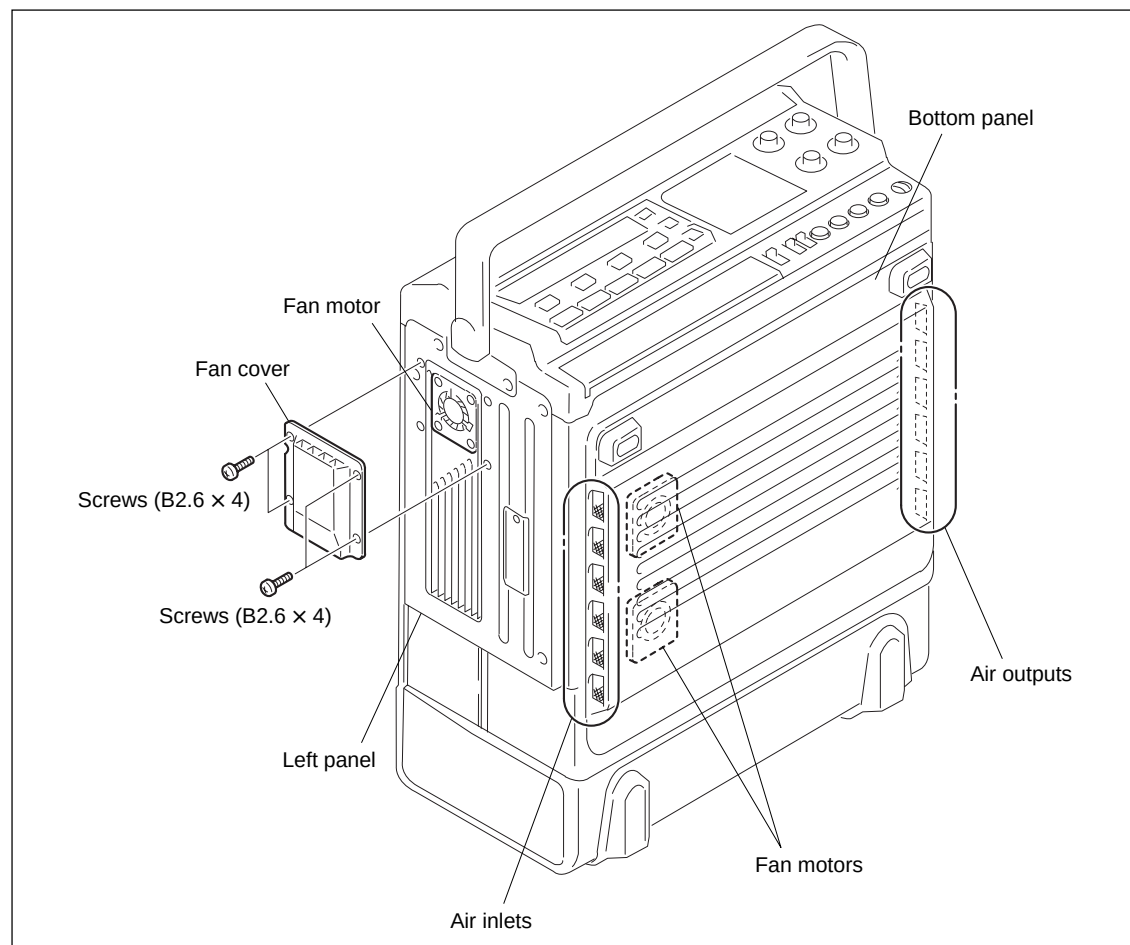
Procedure

1. Vacuum the air inlet of the fan motor to remove dust.
2. Vacuum the air outlet of the fan motor to remove dust.

Fan Motor in the Left Panel

Procedure

1. Remove the four screws and remove the fan cover.
2. Clean the blades of the fan motor using the swab moistened with cleaning fluid.
3. Reattach the fan cover.



5-3. Periodic Check

To keep the unit functioning optimally and to prolong the life of the unit and tape, perform periodic checks regularly.

5-3-1. Hours Meter

In the HDW-250, an hours meter can be displayed on the LCD of the front panel.
Use this as a reference to perform the periodic check regularly.

1. Display procedure

- (1) Press the DIAG button of the front panel using the tip of a clip, etc. to enter the DIAG menu.
- (2) Press the UP or DOWN button to move the * (asterisk cursor) to “HOURS METER” of the DIAG menu.
- (3) Press the SET button. The “HOURS METER 1” menu is displayed.
- (4) Press the SET button again to display the “HOURS METER 1” menu.
- (5) To exit the DIAG menu, press the DIAG button again in the same way as step 1.

2. Contents of display

HOURS METER 1
POWER ON 000000H
DRUM ROTATE 000000H[xx]
SET KEY --- NEXT

POWER ON : Accumulated time of power-on
DRUM ROTATE : Accumulated time of drum rotation
The time in brackets [] indicates the accumulated time since resetting.

HOURS METER 2
TAPE TRAVEL 000000H[xx]
TAPE THREAD 000000T[xx]
<RESET> EXIT

TAPE TRAVEL : Indicates accumulated distance of tape running, calculated from the running time.
The time in brackets [] indicates the accumulated time since resetting.
(e.g.: The tape travel counts 248 minutes for fast forwarding or rewinding a 124-minute tape.)
TAPE THREAD : Accumulation of threading rotation (T: TIMES)
The time in brackets [] indicates the accumulated time since resetting.
<RESET> : Resets the resettable hours meters.

5-3-2. Periodic Check List

The replacement time shown in the following list are not guaranteed period of the parts. Use this list as guidelines form maintenance and inspection. The replacement period varies depending on the operation environment and the conditions of the unit.

Note

Parts in the list that are marked “↓” are replaced at the same time as other parts marked by this arrow.
For details on how to replace the parts shown in the list, refer to Section 2 of Maintenance Manual Part 2, Vol. 1.

Periodic Replacement List

No.	Item	Rotating hours of drum												Replaced parts	
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	Part name	Part No.
1	Upper drum	R	R	R	R	R	↓	R	R	R	R	R	↓	DHR-04-R	A-8316-738-
2	Brush for slip ring	—	R	—	R	—	↓	—	R	—	R	—	↓	Brush assembly (RP)	A-8263-856-
3	Slip ring	—	R	—	R	—	↓	—	R	—	R	—	↓	Slip ring assembly (RP)	A-8263-855-
4	Drum	—	—	—	—	—	R	—	—	—	—	—	R	DHH-04A-R	A-8316-736-
5	Pinch roller	R	R	R	R	R	R	R	R	R	R	R	R	Pinch arm assembly	X-3678-425-
6	Video head Cleaning roller	R	R	R	R	R	R	R	R	R	R	R	R	AHC roller assembly CR cap	X-3949-109- 3-615-320-
7	Cleaning brush for CUE head	R	R	R	R	R	R	R	R	R	R	R	R	CUE brush	3-681-778-
8	Capstan motor	—	—	—	—	—	R	—	—	—	—	—	R	DC motor SCV-0702A/J-N	8-835-534-01
9	CUE/TC head	—	—	—	—	—	R	—	—	—	—	—	R	Audio head EPS244-2103J	8-825-920-02
10	Reel belt (S/T)	R	R	R	R	R	R	R	R	R	R	R	R	Driving belt (2 pcs.)	3-172-003-
11	Solenoid (S/T brake)	—	—	—	—	—	R	—	—	—	—	—	R	Plunger solenoid	1-454-334-61
12	Solenoid (head cleaner)	—	—	—	—	—	R	—	—	—	—	—	R	Plunger solenoid	1-454-607-21
13	Solenoid (pinch roller)	—	R	—	R	—	R	—	R	—	R	—	R	Pinch pressure plunger assembly	A-8278-216-
14	Reel motor (S/T)	—	—	—	—	—	R	—	—	—	—	—	R	Motor R432276751A (2 pcs.)	8-835-441-01
15	S/T threading rail	Replace every 10,000 times of threading												S rail T rail	3-691-360- 3-691-344-
16	Drawer arm (S/T)	Replace every 10,000 times of threading												S arm assembly T arm assembly	A-8269-452- A-8279-109-
17	Intermittent gear	Replace every 10,000 times of threading												Intermittent gear assembly	X-3678-461-
18	Cam gear (S/T)	Replace every 10,000 times of threading												Drawer arm gear Cam gear assembly	3-679-777- X-3678-384-
19	Cassette compartment	Replace every 10,000 times of threading												Cassette compartment assembly (RP)	A-8269-732-
20	Threading motor	Replace every 10,000 times of threading												Motor DN20-Q7Z1B	8-835-440-01
21	T link	Replace every 10,000 times of threading												T link assembly	X-3678-423-
22	Catcher (S/T) and slider	Replace every 10,000 times of threading												S-drawer block T-drawer block	A-8272-676- A-8272-677-
23	ST driving gear	Replace every 10,000 times of threading												ST driving gear	3-691-352-
24	T limiter spring	Replace every 10,000 times of threading												T limiter spring	3-689-899-
25	Lithium battery	Replace every two years												Lithium battery	△ 1-767-156-11

"R" indicates the period between replacing parts.

Section 6

Spare Parts

6-1. Notes on Repair Parts

1. Safety Related Components Warning

WARNING

Components marked $\triangle$ are critical to safe operation.
Therefore, specified parts should be used in the case of replacement.

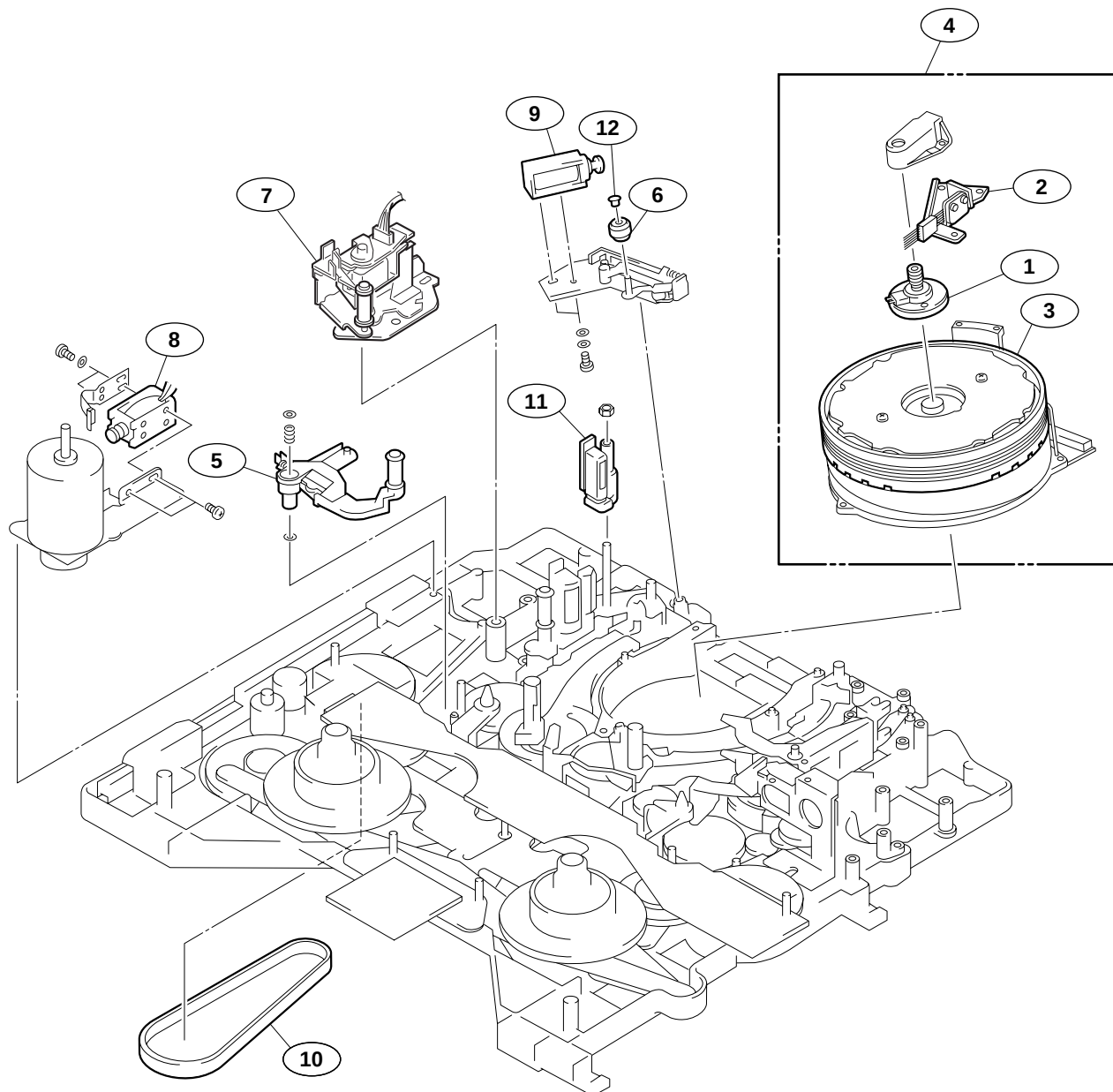
2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.
Parts list has the present standardized repair parts.

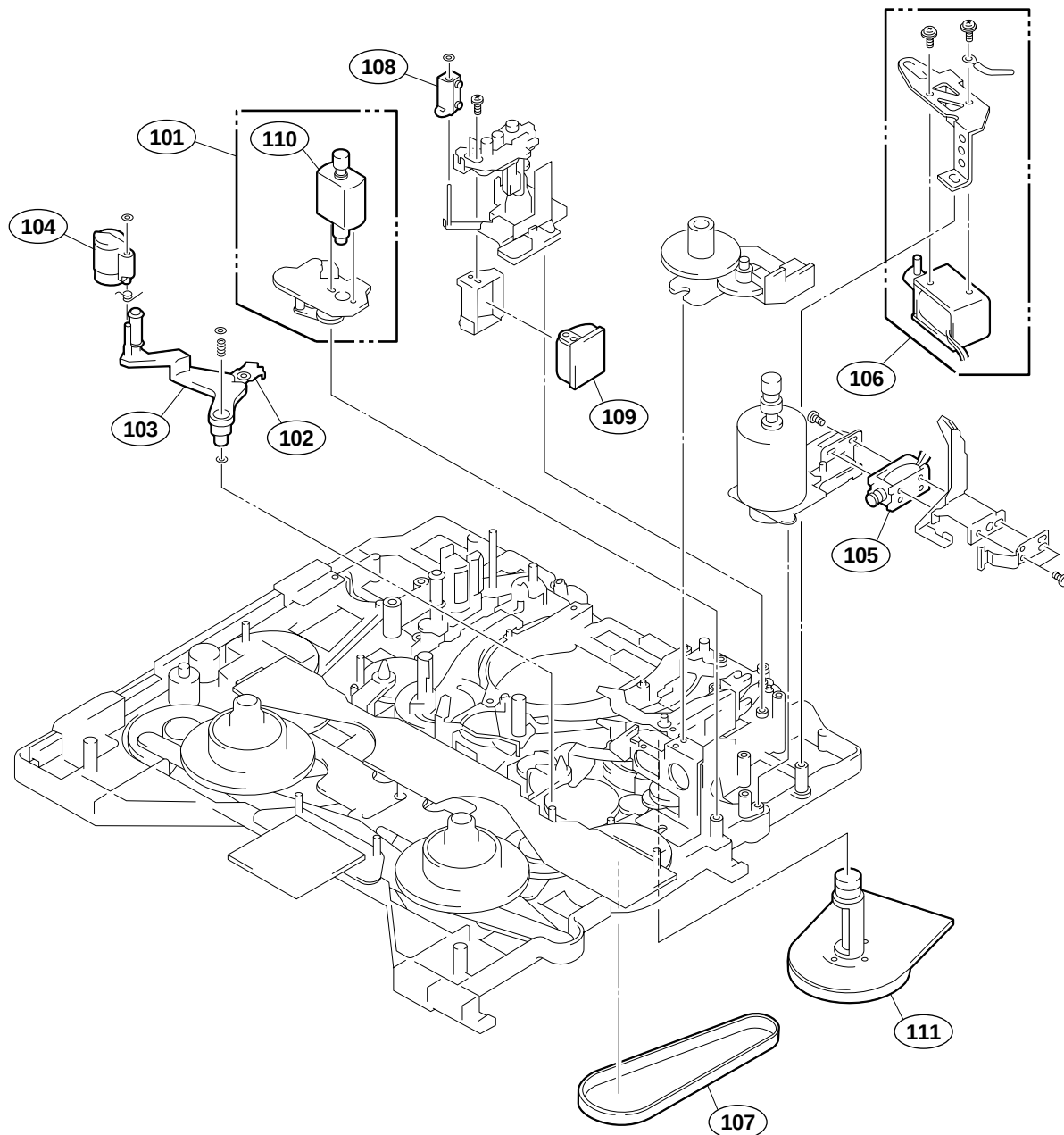
3. Stock of Parts

Parts marked with “o” at SP (Supply Code) column of the spare parts list may not be stocked. Therefore, the delivery date will be delayed.

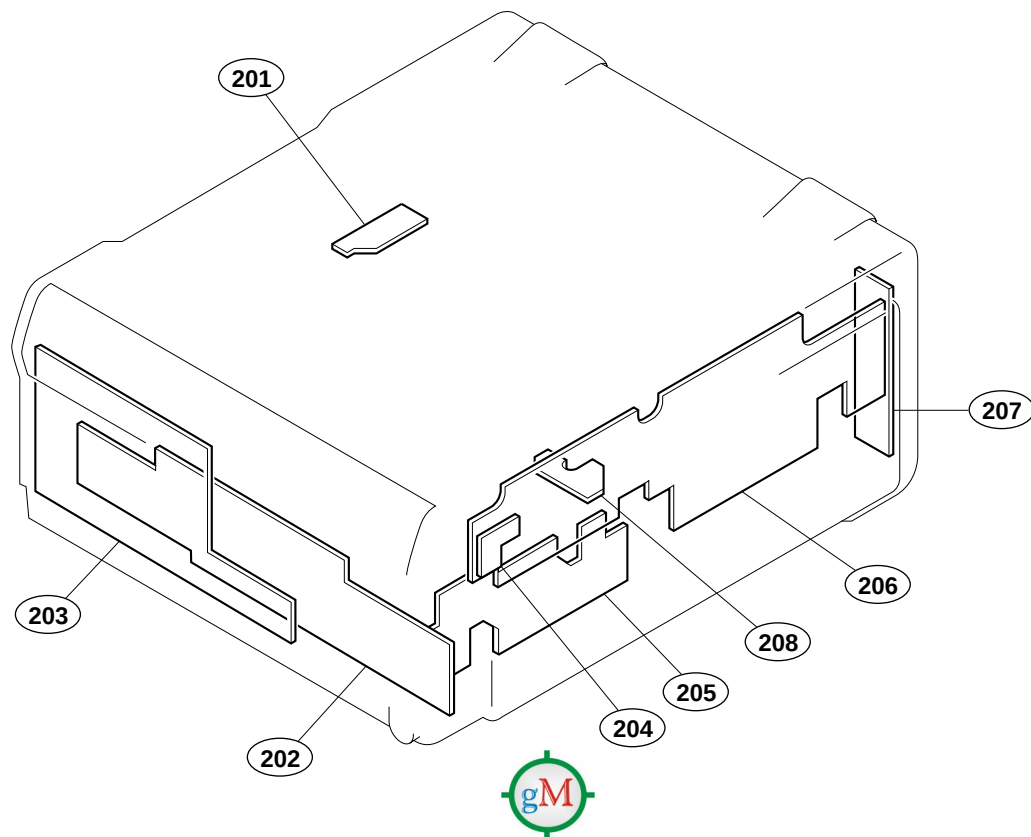
6-2. Exploded Views



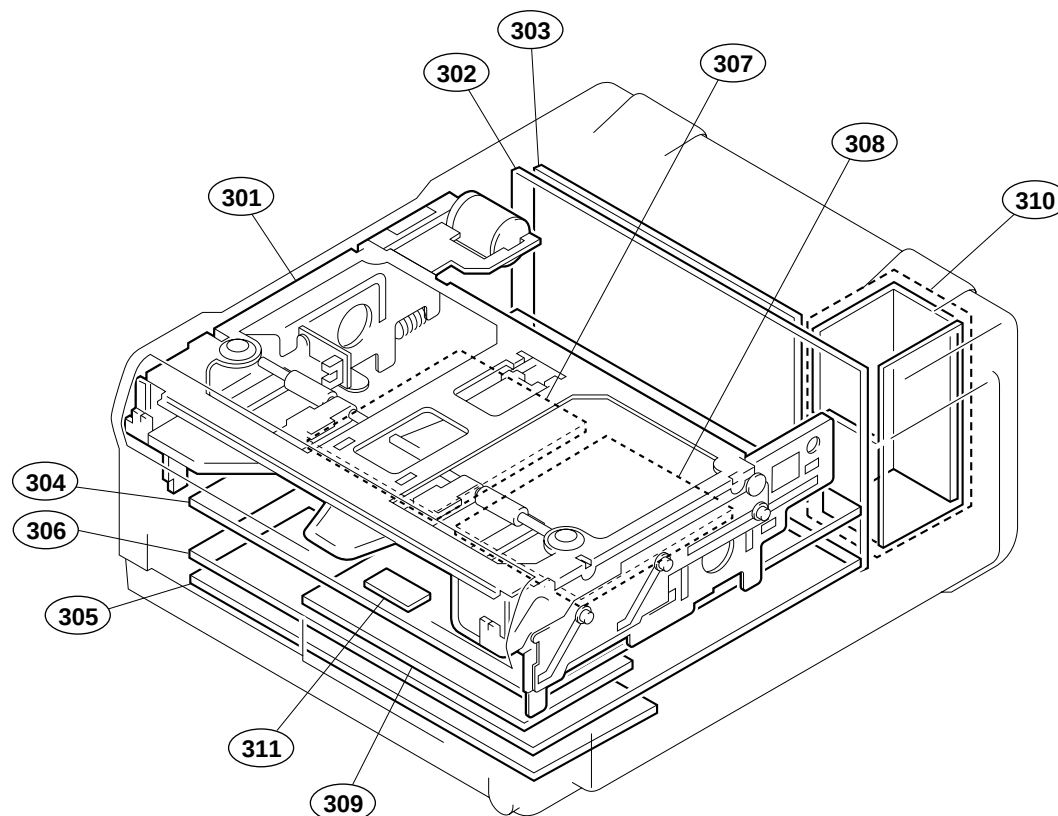
No.	Part No.	SP Description
1	A-8263-855-A	s RING ASSY (RP), SLIP
2	A-8263-856-A	s BRUSH ASSY (RP)
3	A-8316-738-B	s UPPER DRUM ASSY, DHR-04-R
4	A-8316-736-B	s DRUM ASSY, DHH-04A-R
5	A-8269-452-A	o ARM ASSY, S
6	X-3949-109-1	s ROLLER ASSY, AHC
7	A-8322-697-A	s REGULATOR ASSY, TENSION
8	1-454-334-51	s SOLENOID, PLUNGER
9	1-454-607-21	s SOLENOID, PLUNGER
10	3-172-003-01	s BELT, DRIVING
11	8-825-779-72	s CTL HEAD (PS244-21D)
12	3-615-320-01	o CAP, CR



No.	Part No.	SP Description
101	A-8269-450-A	o BLOCK ASSY, GEAR
102	X-3678-423-3	o LINK ASSY, T
103	X-3605-481-1	o SUB ASSY, T ARM
104	X-3678-425-5	s ARM ASSY, PINCH ROLLER
105	1-454-334-51	s SOLENOID, PLUNGER
106	A-8278-216-A	o PLUNGER ASSY, PINCH PRESSING
107	3-172-003-01	s BELT, DRIVING
108	3-681-778-02	s BRUSH, CUE
109	8-825-920-02	s HEAD, AUDIO EPS244-2103J
110	8-835-440-01	s MOTOR DN20-Q7Z1B
111	8-835-534-01	s MOTOR, DC SCV-0702A/J-N



No.	Part No.	SP Description
201	A-6754-272-A	o MOUNTED CIRCUIT BOARD, TR-57
202	A-8276-930-A	o MOUNTED CIRCUIT BOARD, ADA-44
203	A-8276-948-A	o MOUNTED CIRCUIT BOARD, KY-315
204	A-8321-342-A	o MOUNTED CIRCUIT BOARD, DUS-173
205	A-8321-355-A	o MOUNTED CIRCUIT BOARD, CC-82
206	A-8321-356-A	o MOUNTED CIRCUIT BOARD, CP-337
207	A-8321-357-A	o MOUNTED CIRCUIT BOARD, FU-76
208	A-8321-358-A	o MOUNTED CIRCUIT BOARD, DET-36



No.	Part No.	SP Description
301	A-8269-732-D	s CASSETTE COMPARTMENT ASSY
302	A-8321-338-A	o MOUNTED CIRCUIT BOARD, MB-825
303	A-8321-353-A	o MOUNTED CIRCUIT BOARD, EQ-76
304	A-8321-354-A	o MOUNTED CIRCUIT BOARD, SST-13
305	A-8321-709-A	o MOUNTED CIRCUIT BOARD, DPR-125
306	A-8321-710-A	o MOUNTED CIRCUIT BOARD, VPR-53
307	A-8321-887-A	o MOUNTED CIRCUIT BOARD, TX-68A
308	A-8321-889-A	o MOUNTED CIRCUIT BOARD, RX-46A
309	A-8321-959-A	o MOUNTED CIRCUIT BOARD, DCP-22
310	A-8322-042-A	s POWER ASSY
311	△ 1-767-156-11	s IC M4T28-BR12SH1

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